

The Canadian Medical Association Journal



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The Canadian Medical Association Journal

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No. 6

SCIATICA FROM AN ORTHOPÆDIC STANDPOINT

By J. APPLETON NUTTER, M.D.

Montreal

SCIATICA, or pain in the distribution of the sciatic nerve, has been recognized for a very long time. There has been seen, however, but little advance, except in recent years, in the conception of its origin or in its treatment. As the name of a pain it has kept its place to the present day in the nomenclature of disease, in spite of the numerous and vigorous attacks directed against it. Lawson, of London, writing his book on "Sciatica, Lumbago and Brachialgia" as far back as 1872, declared that "the history of sciatica is, it must be honestly confessed, the record of pathological ignorance and of therapeutical failure." Bowlby, in a lecture on pain, published in the *Clinical Journal* as recently as February, 1904, says in reference to sciatica: "what numberless diseases have been lumped under that misleading title! Here is one diagnosis, due to referred pain, of which I am even more suspicious than I am of the term 'rheumatism'! How extraordinary it is to see over and over again that so long as a pain can be given a name that is commonly recognized, the patient seems perfectly satisfied."

Owing to the almost complete lack of knowledge of the pathological anatomy of sciatica there has been the utmost confusion as to its causation and nature. It may be of interest to glance at some of the views once held on the subject of its origin. Fuller, of London, wrote a book, published in 1861, in which he proved to his own satisfaction, at least, that sciatica is essentially a rheumatic disease, due to the pressure of a gelatinous exudate inside the sheath of the nerve. Anstie, of London, in 1871, wrote a book in which

he maintains that sciatica is a neuralgic pain due to disease of the central nervous system. Handfield Jones about the same time admits in his "Studies on Functional Nervous Disorders" (London, 1871) that in a very large number of cases we cannot tell where the cause of the pain really lies. Lawson, whom I have already quoted, bids his readers beware. The pain, he says, may be due to a multitude of diseases, from injury or disease of the hip, spine or pelvis, or of the spinal cord, or of the sacro-iliac joints even, though this latter is excessively rare, nevertheless to be met with occasionally in acrobats. Such pain, he warns, is not sciatica, even though it follows the course of the sciatic nerve, and such cases must be rigorously excluded. If no cause of nerve irritation can be assigned to the pain the case can be diagnosed sciatica pure and simple. Such a differentiation is curious. Buzzard, writing in the *Practitioner* in 1877, reads in a very modern way. He speaks first of sciatica without discernible source of nerve irritation. In the second place, and this is very significant of advance in the knowledge of the malady, he speaks of that form of sciatica arising from known sources. The most usual of these he gives as malignant and other tumors of the pelvis, the pressure of the gravid uterus, rheumatic or gouty inflammation of the sheath of the sciatic nerve (following Fuller), syphilitic periostitis causing nerve pressure, and arthritis deformans of the hip. He claims originality, and I believe rightly so, in the matter of bringing forward this hip lesion as a cause of sciatica. It is interesting to note that in all these sources of peripheral irritation Buzzard, like his predecessors, still has his mind fixed largely on direct pressure and trauma to the nerve trunk itself. We have not yet reached the stage where sciatica is recognized plainly as referred pain. Sir William Gowers, in his "Diseases of the Nervous System" (1889), has even to the present day been almost slavishly copied in many text-books. It is noteworthy that he held strongly to the view that the vast majority of cases of sciatica were due to a neuritis, and were neither neuralgia nor referred pain. He relied largely on the presence of tenderness in the nerve to prove this point, and insisted that underlying most cases was the gouty or rheumatic diathesis. The treatment, as might be expected, was directed against these conditions, and consisted of large doses of colchicum, alkalies, potassium iodide and the salicylates, while numerous local applications were made to the limb. Gowers' insistence on the presence of a neuritis all but killed the then rising belief in the existence of referred pain as a principal source of sciatica. His writings on the subject has, to my mind,

quite the reverse of a progressive effect on the knowledge of sciatica. About 1909, Goldthwait, of Boston, drew the attention of the medical world to the sacro-iliac joints as a possible source of sciatica, and from this time on orthopaedic surgeons have been among the principal contributors to our knowledge of the disease. It is interesting to note that as late as 1913, Dr. W. Bruce, of Bath, England, wrote a whole book to prove that all sciaticas were cases of referred pain from arthritis deformans of the hip-joint. In Osler and McCrae's "Modern Medicine" (1915) the article on sciatica is written by Gordon Holmes of London, and is, as might be naturally expected, very strongly suggestive of Gowers' book written more than a generation previously. Dr. Holmes does, however, to do him justice, point out that to diagnose neuritis (which it will be remembered Gowers insisted was practically always present), one must have anaesthesia, atrophic muscular paralysis or paresis, change in the electrical reactions and loss of the Achilles reflex. The article on the whole is rather old-fashioned for such an ultra-modern system of medicine, but some consolation was got by the discovery that neither Osler nor McCrae had written it. To show how differently Thomas McCrae looks at the subject of sciatica, let me quote from an article of his in the *Medical Clinics of North America* for November, 1918. He urges, to begin with, that we should never content ourselves with the name "sciatica" as a diagnosis, any more than with the name "headache". He gives the case reports of three patients with sciatica. In the first patient the presence of chronic tonsillar infection had given rise to rheumatoid arthritis of the spine, causing pain referred to the sciatic distribution. The second case was due to sacro-iliac disease and the third to chronic gonorrhœal prostatitis, both of which were the source of referred pain. His points are very forcibly stated and so free from the ghosts of bygone doctrines that I feel sure you will find them interesting. In the first place he insists that true primary sciatic neuritis is extremely rare (as contrasted with Gowers' dictum that neuritis was always present where the nerve was found to be tender). Diabetic sciatica must be very rare, according to his experience. As to the so-called gouty diathesis, if sciatica occurs in a patient said to have gout, study the case most carefully to make sure that you are not dealing with arthritis deformans. If gout is present, the sciatica will be probably found to be due to gouty arthritis in the spine, sacro-iliac or hip-joint. As to sciatica being due to the "rheumatic diathesis", do not give this a place in your memories. The term has no definite meaning, and usually covers

ignorance. And in fact when we remember that one man's so-called "rheumatic diathesis" is caused by chronic constipation, a second by chronic tonsillitis, and a third by abscessed teeth, the fact that this term is without definite meaning becomes only too evident. As McCrae says, it is a cloak for ignorance. His article is refreshingly free from the cobwebs of antiquity which so frequently are handed down from one writer to another.

You will have noted that most cases of sciatica are due to lesions of the lumbar spine, sacro-iliac or hip-joints. In fact, in a series of fifty cases studied by Rogers (*Journal of the American Medical Association*, page 425, 1917), forty-nine showed lesions here, the remaining case being one of carcinoma of the prostate. I do not intend to inflict upon you an analysis of the cases which have come under my observation in the orthopædic clinic of the Montreal General Hospital and in my private practice. Several of these have been specially interesting, however, and may be worth describing. One young woman was referred to me with a probable diagnosis of hip-joint disease. She had indeed been treated by a plaster-of-Paris spica on this supposition, but with little benefit. An examination showed perfectly free motion in the hip-joint of the affected side, except when the sciatic nerve was put on the stretch. There was tenderness over the nerve back of the hip, and the pain extended down to the knee and calf in the distribution of the sciatica. The diagnosis of sciatica was thus made evident. It then became necessary to search for the cause of this pain. I could find no signs of rheumatoid disease in her spine or sacro-iliacs, nor was there any limitation of motion or muscle spasm here. There was no history of swelling of the fingers or other joints to indicate that infection had ever existed. There being no evidence of inflammatory trouble to account for the pain, I examined her frame to see if anything were wrong from a mechanical or static standpoint. This time the search was more successful. It was noticed that she stood in what might be termed a slumped attitude, with the stomach protruding and the shoulders forward. Her ankles were very weak and the feet badly pronated. In other words she had a very faulty posture shown most particularly by her feet. A properly fitted corset helped her to a better attitude, and arch supports were made for her feet. The relief was almost immediate, and by the time the girl was ready to go home for a few months' rest, the pain had largely disappeared. This, then, would be a case of sciatica due to faulty posture and flat feet, and cured almost wholly by mechanical means.

A second case of apparently static origin was in a young woman of heavy build, with a prominent abdomen and flat feet. There were no signs whatever of vertebral, sacro-iliac or hip disease of any kind. The pain had been present off and on for months. The abdomen was supported by a well-fitting corset specially designed to that end, and for the feet arch supports were prescribed. Relief was immediate and most gratifying. This case illustrates the importance of a prominent abdomen in the causation of sciatica, an element which is not always recognized as of first-class importance. In fact, a prominent and pendulous abdomen is of itself, I feel sure, capable of causing sciatica. The weight of the abdominal contents pulls directly upon the lumbar spine, setting up a chronic strain of this region, with pain referred to the sciatic nerve. It need hardly be mentioned that a prominent abdomen is one of the commonest causes of backache, and one that yields readily to treatment, which is support.

A third case of interest was one in a young mother whose baby had been born six weeks previously. A very crippling sciatica followed, and the patient was hardly able to walk. There was present tenderness over the posterior superior spine on the affected side, and raising the leg with the knee extended caused pain referred to the sacro-iliac region. The application of a very tight flannelette spica on the affected side gave much relief. It was noted also that she had a very flat foot on the side of the pain, and this was accordingly strapped in a position of inversion. After this second bandaging the patient experienced still further relief, which has continued. In this connection it may be noted that a tightly applied flannelette spica affords an excellent therapeutic test of sacro-iliac strain, as in most cases it rapidly relieves the pain. It seems to be more reliable, as infinitely more comfortable, than strapping the pelvis with adhesive plaster. This case would seem to be one of sacro-iliac strain brought on by the trauma of child-birth, at a time when the ligaments of the pelvis are recognized to have become softened and relaxed by excessive hyperæmia. The flat foot no doubt threw an additional strain on the already weakened joint.

A fourth occurred in a young man of thirty years, heavily built and with a prominent abdomen. His feet were moderately pronated. His spine presented some tenderness at the region of the lumbo-sacral junction, and there was a history of previous attacks of sciatic pain. X-rays of the spine revealed definite bony deposits at the sides of the bodies of the fourth and fifth lumbar vertebrae, characteristic of arthritis deformans of the spine. His

pain thus stood revealed as due to the irritation arising from this lesion. Somewhat more difficulty was experienced in the search for a cause of the arthritis. An examination of the genito-urinary tract proved negative, as was also the Wassermann test of the blood. The teeth were in perfect condition, and the intestinal tract functioned normally. The tonsils, however, were shown to have a purulent exudate in their crypts, and their removal was advised. This was done, the lower spine was supported by a brace, baking and massage were given daily, and the patient's condition gradually but steadily improved.

Other causes of the disease are lesions of the hip-joint (among which arthritis deformans is the most commonly found), new growths, or tuberculosis, or injury of the bones of the lower spine or pelvis. Dr. Finley not long ago had in his wards at the Montreal General Hospital a case of multiple sarcomatosis with sciatica due to pressure in the pelvis. In fact, any form of pelvic disease capable of causing pressure on the sciatic nerve, to which may be added the gravid uterus, may be a cause of sciatica. Psoas abscess is a rare cause, as also is the presence of varicose veins inside the sheath of the nerve. Syphilis should be sought for in obscure cases. It is more likely to be present as a meningitis, as an arthritis of the lower spine or as a periostitis, though true gummatous neuritis is possible. Gonorrhœa acts commonly through the medium of an arthritis, though gonorrhœal neuritis has been described. It must be very rare. Anatomical variations in the lower spine may be a cause.

In the differential diagnosis beware of the pains of tabes. Sciatica is also fairly confused with hip-joint disease. It sometimes simulates the painful spasm of the peroneal muscles which so often accompanies a rigid flat foot. The pain seen in the calf of the leg which accompanies intermittent claudication has been mistaken for sciatica, as also that due to varicose veins.

Treatment. As can be easily seen, this is very varied and depends upon the cause. Tonsils, if diseased, may need removal, abscessed teeth may need extraction, a chronic prostatitis may need treatment. An arthritic spine needs fixation, a relaxed sacro-iliac joint should have efficient support, disease of the hip-joint calls for immobilization. All these measures will be found to have a marked effect upon the pain.

For the affected limb absolute rest is essential, pillow fixation as a rule being found useful. The length of the period of rest will depend to a considerable extent on how successful has been your

search for and treatment of the cause of the disease. For the pain, acetyl-salicylic acid is useful, as also the salicylates and drugs of the coal-tar class, such as phenacetin. Morphine should be avoided wherever possible. Counter-irritation over the course of the nerve is valuable. The Paquelin cautery is very useful, and should be used only very superficially. The application of mustard and the use of blisters may give relief. The injection of sterile water, alcohol, or weak cocaine solution into or beside the nerve, is not often practiced, as permanent damage may be done.

Nerve stretching is no longer in favor, and properly so. In subacute cases baking and massage will generally be found useful. Hydrotherapy is sometimes of value, but like electricity more often gives only temporary relief. Anæmia should be treated with iron and arsenic. A special diet is indicated only in cases of gout, diabetes, and rheumatoid arthritis of intestinal origin. To sum up, the treatment of sciatica should be the removal or correction of its cause, and while doing this we should endeavour to relieve the pain.

The injection of sterile water into the epidural space of the sacral canal has given relief which has lasted several hours or even longer. It is a procedure easy of accomplishment and unlikely to result in damage to the nerve.

At a public gathering of Oxford University it was decided to raise a permanent memorial to the late Sir William Osler to take the form of "The Osler Institute of General Pathology and Preventive Medicine".

TRAUMATISM OF THE SPLEEN

BY E. L. CONNOR, M.D., C.M.

Lethbridge, Alberta

THE literature of ruptured spleen was so very well reported by Willis in the July number of *Surgery, Gynecology and Obstetrics*, that I will not take up your time with that part of the subject, but will confine myself to a few remarks based on three cases which I have treated during the past fourteen years.

No doubt most of you consider that rupture of the spleen is a rare condition, but I believe that it is more frequent than is generally supposed. It escapes diagnosis and this is my reason for wishing to draw your attention to the subject.

Abstracts of the case reports are as follows:

Case 1. Male, age forty-two. Family and previous history unimportant.

History of his present illness. He was riding on a lumber waggon when his team ran away, throwing him against one of the wheels on to the ground. He was dazed for half an hour or so. The pain was so intense that he went off the road to lie down, where he was picked up four hours later and taken to a ranch house. Although he had considerable pain, he did not think he was badly hurt. Eight hours after the accident he had become so white that his friends were alarmed and brought him to the hospital.

Condition on admission, twelve hours after injury: extreme pallor, moist, clammy skin, almost pulseless, respiration very shallow—practically entirely thoracic. Abdominal signs were those of an acute abdomen with a dull percussion note in left flank.

Diagnosis. Internal abdominal hæmorrhage.

Treatment was undertaken to combat shock, but while we were preparing to do blood transfusion, the patient died, forty minutes after admission.

As our experience showed later, this was clearly a case of death due to lack of early surgical care. The autopsy showed a large rupture of spleen with abdominal cavity full of blood.

Case 2. Male, age twenty-four. Family and personal history unimportant.

History of his present illness. The patient was disinclined to answer questions, partly because he had been given considerable brandy as a stimulant and partly because he was not oversupplied with brains. We gathered from his employers on the ranch that he had been trying to catch a colt, which in some manner kicked him. He was half a mile away from the house at the time, but was able to walk home, undress himself and go to bed. He complained very much of pain in his left arm and shoulder and vomited two or three times during the afternoon. He did not sleep that night on account of pain in his shoulder and difficulty in breathing. The next morning he was very weak and had some pain in the abdomen which alarmed the mistress of the house, so they decided to bring him into town.

Condition on examination twenty-four hours after injury. Temperature 101°, pulse 132, respirations 28. Pulse very soft, skin pale and clammy. Chest shows marked dulness of lower half of left chest and absence of breath sounds up to the level of the fourth rib. Respirations very shallow. Complained very much of severe pain through upper part of left chest and left shoulder. Examination of the left shoulder showed there was no injury and that moving the arm did not affect the pain.

The abdomen was very rigid and tender all over. There was a marked dulness in the left flank and from umbilicus upward to gall bladder region. There was no nausea nor vomiting. The urine was very highly coloured, but outside of a few blood cells, was negative. Hæmoglobin, 75 per cent.; leucocytes, 14,000; reds, 3,500,000. The diagnosis was made of internal hæmorrhage from either spleen, liver or kidney, and we transfused 500 c.c. citrated blood.

Operation. Four hours later he was prepared for operation and anæsthetized with ether. We started with a small left rectus incision opposite the umbilicus. In opening the peritoneum we found free blood, so enlarged the incision upwards and across the middle line which gave us a good exposure of the source of bleeding in a large rupture in one end of the spleen. As the rupture in the spleen was oozing freely, we decided that we could do nothing to stop it, so tied off the pedicle with two double ligatures and removed the spleen. We placed a large cigarette drain through a stab wound of the left loin and after removing considerable blood, closed the abdomen. When he left the table, although his pulse was

rapid, 160 to 170, it was of better quality and his colour much better than it was when he entered the hospital. He was stimulated freely and given saline continuously for the first twenty-four hours. From this time on he made a steady recovery. On the third day, the drain was removed, but the drainage had been slight. His hæmoglobin on the tenth day was 80 per cent. When he left the hospital on the twentieth day it was 85 per cent. We believed that there was some pleural effusion which might have been blood, but as all physical signs had disappeared by the sixth day, we doubted whether much injury had been done to the lung. He was under observation for about three months, during which time his weakness gradually disappeared and he then returned to work.

Case 3. Female, age thirty-seven. Family history, negative. Personal history: married seven years, four children, all normal labours; no illnesses of interest.

History of present illness. About six years ago, while milking a cow, it tried to kick her, pushing her violently to the ground. When she got up, she had a sharp pain in her left loin and lower chest, and found it very difficult to breathe. As there were no signs of bruising, she did not think she was badly hurt. The next day she consulted her physician, who told her she had pleurisy. After about six weeks' treatment, she believed she was cured, as the pain and difficulty of breathing had disappeared, except that on a deep respiration she had pain in the upper part of chest and left shoulder. From that time until the present, she had had irregular attacks of pain in upper left abdomen, radiating to left shoulder. These attacks lasted two or three days, coming on at six or eight weeks' intervals. At the time of the attack she would notice she was very pale and that after the attack was over she would be very high coloured for about a week. She consulted a number of doctors during the period of six years and received different diagnoses. About two years ago one physician said she had tumor near the left kidney. Eight weeks before coming to the hospital, she was confined by a physician who knew nothing of her history. He discovered the tumor while palpating the abdomen, after the delivery. During the past two months the tumor has increased very much in size.

Present condition. Patient is a small emaciated woman with very sallow complexion and appears to have a very grave anæmia. Temperature for three days before operation was 90° to 100°, pulse 90 to 115, and respirations 20 to 24. She had two complaints only for which she sought relief, one is her inability to retain food for

more than fifteen or twenty minutes and the other a general weakness.

The examination of the heart and lungs is negative.

Examination of the abdomen in a standing position, shows her to have a large tumor which extends one and a half inches below the umbilicus, filling the whole upper abdomen. The whole area is very dull on percussion and the mass fixed in position. At the lower border of the tumor at the umbilicus, we thought we could make out a notch, although it was indefinite. When she was lying down the position of the tumor changed very little, only about one inch. No other abdominal organ, except some soft intestine, could be made out.

The stomach examination showed a deficiency of acid, but was otherwise negative. During the three days previous to operation, almost any food we gave her was vomited within one hour.

The urine showed specific gravity of 1010, was very pale and had considerable pus. Microscopic examination showed considerable blood, lots of pus, and a few casts. A total functional was done, which showed the two kidneys to be excreting 55 per cent. of normal. We did a cystoscopy which showed normal urine coming from right side, and the left side secreting urine with specific gravity 1002, and all the pathological elements of the total specimen. A differential functional showed the right kidney to be doing 90 per cent. of the total function.

The blood examination showed 3,250,000 red, 20,000 leucocytes, and hæmoglobin 80 per cent. The blood picture was otherwise normal.

The diagnosis further than abdominal tumor was not made, but a hydronephrosis of the left kidney was much favoured, although the spleen or the liver could not be eliminated from the diagnosis.

After three days of observation and preparation, she was anæsthetized with ether and a left rectus incision readily exposed a large tumor, which, after some exploration, was found to have a soft area at the left and upper side. The stomach and liver were out of reach, so we decided to aspirate with a gall bladder trochar, with the object of reducing the size of the tumour. We removed considerable fluid, but due to the force with which it came out through the trochar, some was lost. We were, however, able to collect nine and a half pints of fluid and debris, which was mostly old blood clot and fragments of broken down tissue. We then found that the collapsed wall of the tumor was part of the spleen, so we decided to do a splenectomy, which we did without much

difficulty as far as the pedicle of the spleen was concerned, but the separation of the wall of the tumor from the diaphragm and the anterior wall of the abdomen, gave us a great deal of difficulty. This left a very large oozing surface, which worried us for some time. The liver was about one quarter of the normal size, and was jammed high up in the right dome of the diaphragm. The common duct, pylorus and duodenum were displaced below and to the right. The stomach was greatly elongated and displaced to the right. The right kidney felt normal and the left kidney felt normal except that it was one half the size of a healthy one. We placed a heavy roll of gauze into the left dome of the diaphragm and out through a large stab wound of the left loin, our object being to control the oozing. When we started to suture up the abdomen, the picture was very much that of a post-mortem abdomen, with all the organs removed. Examination of the specimen showed that it was a large thick walled cyst of the spleen, which had evidently started by intra-capsular rupture, and had continued bleeding each time that the pressure was sufficiently relieved by the expansion of the capsule. The spleen and sac and contents we were able to measure, weighed eleven pounds, or, according to "Balfour's" recent paper, four times more than the largest spleen yet removed at the Mayo Clinic. The operation required about one and one-quarter hour's anæsthesia, and the patient left the table in only fair condition. After forty-eight very stormy hours, she started to improve, and on the fifth day had settled down toward a recovery.

When she went home on the twenty-third day, the function of stomach, intestine and kidney was almost normal. When we heard from her about a year later, she had gained fifteen pounds and was feeling well.

From a study of these cases and some of the small amount of the literature on the subject, we would say that the condition might be very well divided into two classes according to the pathological findings, that is whether the rupture is intracapsular or through the capsule, but I believe it is of more value to divide them into two classes as we clinically find them.

First. Where the body has received a very crushing injury and the patient dies within a very short time from shock and hæmorrhage.

Second. Where the spleen is ruptured from a slight injury which may leave no mark on the body.

The cause of rupture of the normal spleen, under the second clinical division is very hard to explain, and only one solution has

been offered, that the spleen is very movable and when the body receives a blow it is the sudden recoil of the spleen against the ribs, which causes it to rupture.

In the chronic hypertrophic spleen, rupture is induced by the slightest violence, such as a light blow over the splenic area, or even turning in bed.

The diagnosis must be based upon: (1) the history of injury; (2) on a definite interval before the patient realizes that he is seriously ill. This does not apply to rupture of an hypertrophied spleen, in which the hæmorrhage is immediately profuse and rapidly fatal. (3) On the referred character of the pain, which is generally to the left chest and shoulder; (4) difficulty in breathing; (5) signs of internal hæmorrhage, cold white skin, soft rapid pulse and sub-normal temperature in the first six hours; (6) rigidity of the abdomen; (7) an increasing area of dulness in the left upper quadrant of the abdomen and the left flank. There may be vomiting, but generally there is no nausea.

A differential diagnosis would have to be made between perforated gastric or duodenal ulcer, ruptured kidney, hæmo-thorax, and mesenteric embolus.

Perforated ulcer of the stomach or duodenum, is ushered in by very sudden, severe abdominal pain, acute vomiting and nausea, and signs of intense shock, whereas in a ruptured spleen there is frequently severe pain referred to the left shoulder and upper arm and the signs of shock or hæmorrhage develop slowly. This pain in the shoulder is considered to be a reflex from irritation of the phrenic nerve supplying the diaphragm referred along the other sensory nerves originating in the third and fourth cervical segments of the spinal cord. In ruptured kidney, the dulness is confined to the loin and the abdominal tenderness is rarely marked. The pain is generally referred down the ureter to the groin. The urine contains blood and the patient complains of colic due to the passage of blood clot.

In hæmothorax the abdomen may be rigid, but is usually "resistant" on the affected side. The heart may be displaced and the constitutional signs of hæmorrhage are not so well marked. There is greater difficulty in breathing and there may be pronounced cyanosis.

In mesenteric embolus, the sudden acute abdominal pain is generally at the umbilicus with vomiting, nausea, signs of shock, without those of hæmorrhage, followed early by marked tympanites, and intestinal obstruction. In many cases it may be impossible to

make an exact diagnosis. The history of violence, however slight, and the signs of internal abdominal hæmorrhage warrant immediate exploratory incision.

Treatment. The treatment of ruptured spleen can only be considered as surgical inasmuch as spontaneous cessation of bleeding is not to be expected.

From our experience with these three cases we believe the first and most important part of treatment is early diagnosis of internal abdominal hæmorrhage; then, if necessary, an immediate blood transfusion to obtain temporary improvement. The technique of the citrate method is so very simple it should be available in every small hospital, and the blood group of possible donors should be on record.

As soon as the effect of the transfusion is apparent, the patient should be anæsthetized and the abdomen opened through a left trans-rectus incision.

The source of bleeding being found in the spleen the incision is extended to the costal margin, and for greater freedom of access an oblique incision may be made from the vertical incision outward and upward.

Removal of the spleen is the only certain method of controlling the hæmorrhage. In selected cases of small clean cut rupture of the capsule not extending to any great depth, suture gives good results. Linked mattress sutures of plain gut should be employed.

It is inadvisable, however, to spend time in suturing when the patient shows undoubted effects of blood loss.

Removal of a previously healthy spleen presents but two difficulties: ligature of the pedicle and separation of the tail of the pancreas. It is important that the pancreas be not injured as escape of its secretions may jeopardize the success of the operation. Delivery of the spleen through the incision on to the abdominal wall can usually be done with ease. This manœuvre facilitates the separation of the tail of the pancreas from the pedicle, as the parts are in full view. A short vertical incision through the peritoneum allows the pancreas to be stripped from the pedicle by gauze pressure.

The pedicle is clamped, then ligatured en masse. Individual veins may require ligature and finally the splenic artery should be isolated and tied proximal to the mass ligature. The gastro-splenic omentum containing the vasa brevia of the stomach requires clamping and tying off and this should be done as close to the spleen as is possible.

Blood clot and fluid blood should be removed from the cavity and the incision closed without drainage. It is of advantage to fill the abdomen with normal saline at a temperature of 115° F.

Prognosis. The prognosis will wholly depend upon the time which elapses from the receipt of injury to that of operation.

When the operation can be performed in the first twelve hours after the injury, in reasonably good surgical surroundings, the mortality should not be greater than that of an early acute appendix.

The patient's previous condition as regards heart and kidney, will very greatly affect the prognosis on account of their importance in the recovery from the loss of blood.

Conclusions. First—Ruptured spleen can only be treated as a surgical condition of the abdomen.

Second—Although the severe symptoms may be delayed, we should more often think of this condition in examining patients with histories of slight injury to the lower left thoracic region.

Third—Pain in the left shoulder when no injury can be found about the joint, should at least be considered as being referred from the spleen.

Fourth—Splenectomy is not a difficult operation, and should be undertaken by any man who has reasonable operating facilities.

Fifth—Ruptured spleen should always be considered as a condition demanding early treatment rather than postponed treatment at some large centre.

THE Honourable Justice Hodgins has reported to the government on the result of his investigations as commissioner on the mentally defective of Ontario. In his report he sums up the situation by stating that the unwatched mental defective is the cause of great crime production, and the province has never yet done its duty towards him. He strongly advocates the elimination of these unfortunates from the school and the street, a process which would, he affirms, empty the jails of half their inmates.

SYPHILIS AND GONORRHOEA FROM THE PUBLIC HEALTH POINT OF VIEW

By R. R. McCLENAHAN, B.A., M.B.

Provincial Board of Health of Ontario

AS a great deal of interest in syphilis and gonorrhoea has been aroused of late years, and as the seriousness of these diseases with the resulting loss to industry has been brought to the fore, the measures being taken from a public health standpoint by the Provincial Board of Health of Ontario will, no doubt, be of interest to the profession.

On the advice of the provincial public health officials, the medical profession and prominent social workers throughout Canada, the Canadian Government made a grant of \$200,000 (this to be a yearly grant to last for at least three years if conditions warrant it) towards combating venereal diseases. This grant was divided among the provinces according to population, and was given on the understanding that the provinces would advance an equal amount. \$10,000 of this grant was made to the Dominion Council for combating venereal diseases, a voluntary organization whose aim was along the lines of education, advertising and propaganda. The share allotted to the Province of Ontario was \$57,473.68.

The Ontario Government advanced an equal amount, making the total sum of \$115,000 available for the campaign in Ontario.

A division of venereal disease is being organized. This bureau will have charge of the effort of the Provincial Board of Health. It is proposed to divide the campaign into two heads:

1. Education.
2. Treatment.

Education. The most important part of the campaign is education along public health lines. This education will be general in character. It will embrace the medical profession, dentists, druggists, nurses, public men and business officials, social workers, and the general public. A very excellent scientific book called "To-day's world problem in disease prevention," written by John A. Stokes, of the Mayo Clinic, is now in the printer's hands,

and will shortly be available for all medical men free of cost. This book takes up the venereal diseases in a practical and interesting way and will no doubt, be of great value to medical men throughout Ontario.

Pamphlets and bulletins are in course of preparation for dentists asking their support and also for druggists enlisting their support to fight the dangers of quacks and self-treatment.

The Venereal Diseases Act and the regulations are being strengthened and improved so that the treatment of these diseases may be made more efficient.

Pamphlets will be printed suitable for all classes, including nurses, social workers and the home. Lecturers will be sent out where desired to put the dangers of these diseases fairly before the public. There will be an advertising campaign carried on in newspapers and periodicals in Ontario. It is also proposed to show films from time to time on the venereal problem. The Dominion Council for combating venereal diseases has such a film, which will be shown very shortly throughout Ontario. All available methods for placing the venereal problem before the public will be used.

Treatment. No campaign of this character, however, can be complete unless adequate free treatment is provided as well. At the present time all cases of venereal diseases in reformatories and prison farms, etc., are being treated by a specialist medical officer employed by the Provincial Board of Health. All inmates of prisons, reformatories, jails, etc., are examined for venereal disease—smears are taken on all women and on men if considered advisable. All inmates have Wassermanns taken on admission. All cases are treated and kept in institutions until considered safe from a public health standpoint whether this necessitates their being kept over their time or not. These cases when set free are referred to the local medical officer of health for further treatment or observation as necessary.

A license to manufacture an arsphenamine product has been given to the board. Through it the board has power to sell or give free of charge an arsphenamine product to its clinics and also to hospitals and institutions throughout the province. It is expected that the product will be available in two months' time.

The board is arranging to establish special treatment clinics in the larger cities throughout the province for the free treatment of venereal diseases. These clinics are being very generously dealt with and it is hoped that the treatment they will be able to give

those infected and in need of free treatment will be of help in preventing the spread of these diseases.

The following proposition is being presented to the municipalities where, in the opinion of the board, a clinic is advisable. A schedule of apparatus and furnishings suitable for the adequate treatment of these diseases has been drawn up and will be part of the standard equipment required before government aid will be given the clinic.

The board feels that the choice of a site for the special clinic or clinics in the various municipalities should be left to a certain extent in the hands of the local authorities who understand local conditions. The board would suggest, however, that where facilities already exist as in the case of hospitals, etc., other things being equal, these facilities should be used. The board will afford the following assistance to each clinic established:

1. For the purchase of furnishings and apparatus for a special clinic—\$1,000. (It is thought that the cost of the apparatus and furnishings will not exceed this amount.) Where a clinic is already in existence and up to the standard, the same financial assistance will be given.

2. To assist in the payment of a social service nurse, \$500.00 yearly.

3. For each out-patient treatment for gonorrhœa, 50 cents; for each out-patient treatment for syphilis, 50 cents. (No more than one treatment each day will be paid for.) For each out-patient treatment for syphilis in addition, free "salvarsan" will be provided—as soon as the board is in a position to furnish its own product.

4. In the case of patients treated in the hospitals the sum of 25 cents in addition to the foregoing grants will be paid to the hospital for each day of indoor treatment up to three months, at the end of which time the indoor grant will cease.

5. Standard record forms for the use of these special clinics will be supplied by the board.

In return for this assistance the board will require that the clinic will be kept up to a certain standard as follows:

1. The special clinic shall be for the treatment of venereal diseases.

2. The apparatus and furnishings for the clinic shall be as follows: (See schedule (a).)

3. The personnel of the clinic shall be:

- (a) One specialist in venereal diseases who shall be appointed by the hospital if the clinic is in connection

with a hospital and by the local board of health in other cases. This officer must also be satisfactory to the provincial board.

- (b) Such medical assistants as may be necessary shall be appointed on the same basis.
- (c) One full time social worker who shall be a graduate nurse.
- (d) One clerk, if the clinic is treating more than forty cases per week.
- (e) One male orderly.
- (f) If possible, one undergraduate nurse to assist in the clinic.

4. All treatment in the clinic shall be free.

5. At least one night and two day clinics shall be held per week. (This may be modified on agreement.)

6. Separate hours shall be set aside for men and women in the clinic, also, if possible, separate hours for the treatment of gonorrhoea and syphilis.

7. Weekly reports will be required on forms supplied by the board.

8. The clinic including its records, apparatus, method of treatment, etc., shall be open to inspection by the board.

9. The municipality will be expected to advance an amount for upkeep of the clinic or clinics which shall be approximately equal to the amount advanced by the board (See section 14, sub-sections 1 and 2, Venereal Diseases Prevention Act.)

10. The social service nurse shall follow up cases outside the clinic to see that all patients continue treatment and also that any possible contacts are examined.

11. Accounts should be rendered at the end of the month and will be paid on the board's certificate.

12. The board reserves the right to modify these rules if such should, in the interest of the clinic, be deemed necessary.

In conclusion the board wishes to express its appreciation for many valuable hints on the subject given by many of the medical men in Toronto and elsewhere who have given a great deal of their time gratuitously in this work. The board feels that special mention should be made of the work of Professor Duncan Graham, Professor Fitzgerald, Dr. Edmund King, Dr. Gordon Bates, and many others.

This campaign can only be a success through the closest co-operation and assistance of the medical profession throughout Ontario, and the board feels that this will be given freely.

A PLEA FOR THE SPHINCTER ANI

BY F. N. G. STARR, C.B.E., M.B.

Toronto

SOME years ago when cruising on the Georgian Bay, I landed upon what I supposed was an uninhabited island, to prepare lunch. When gathering some firewood I became conscious, as did Robinson Crusoe of ancient fame, of a "presence"! The preparation of lunch was, for the time being, abandoned, and I began to make a search for "the man, Friday". My difficulties were greater than those of the searcher in the ancient fairy tale, for there was no sand in which Friday could make footprints and thus mark out a path to lead me to him. However, upon raising my eyes to a projecting rocky precipice in order to determine the easiest way of ascent, I found the "presence" in the form of a sturdy squatting French-Canadian in the act of defecation! His back was to me and I had an excellent opportunity of studying the process. The sphincter dilated to fully two inches while an enormous bolus of fecal matter was passed.

While ruminating upon the sight, it occurred to me that if such could happen in a normal defecation, we surgeons were needlessly damaging the sphincter and expending uselessly much energy in forcibly dilating it, when there might be some means of bringing about a physiological dilatation preparatory to operations for hæmorrhoids. If this could be accomplished, we might save not only our patient's sphincter, but we might also obviate a great amount of the after pain. I am convinced that a good deal of the pain is due to the contraction of the undamaged fibres pulling upon the damaged ones, after forcibly tearing the muscle, for it is impossible to tear them all. It seemed to me, too, that one would prevent that beastly inconvenience of a prolonged incontinence of gas and feces following these operations.

Upon my return to the hospital, when a case of hæmorrhoids turned up for operation, I had him put in the lithotomy position under light anæsthesia, passed a long pair of artery forceps smeared

Read at the annual meeting of the Ontario Medical Association, 1917.

with vaseline through the anus well up into the rectum, and gently rubbed the point against the rectal mucous membrane. After a few seconds I noticed the sphincter begin to relax. As the forceps were withdrawn, I caught the rectal mucous membrane just inside the anus, and what was my delight when the whole pile-bearing area presented itself to view. The operation was then proceeded with and completed in a few minutes. When completed, the catgut sutures, which had been left long as tractors for a final inspection and scarification of the anal margin, were cut, and a morphine suppository inserted. Then a little diffuse pressure was made over the anus with a moist sponge, when the pile stumps returned within the anus. A vaseline dressing was applied and the patient sent to bed.

Imagine my surprise when I dropped in during the afternoon to find him propped up in bed, smoking a cigarette and reading the evening paper. This I may say is not always the case, for some people are more sensitive to pain than others, and some do suffer pain, but since adopting this means of dilating the sphincter, I have not the same dread of my first visit after operation as I formerly had. I have used it many times since and can commend it to you not only as an excellent means of exposure, but also as a great pain saver.

INCORPORATION has been granted to the Kingston Clinical Association Limited, with a share capital of \$100,000. It is purposed to conduct a medical clinic which will supply a standardized systematic examination. Specialists in each branch of medicine with every form of modern equipment will be employed. It is the first clinic of the kind to be established in Canada.

SOME X-RAY PLATES AND THEIR SIGNIFICANCE

BY G. S. GORDON, M.D.

Vancouver

Formerly officer in charge of Genito-Urinary Surgery at Moore Barracks, Canadian Hospital (No. 2 C. G. H), Shorncliffe, England

THE x-ray machine in our hospital overseas was eccentric. It did its best work when our radiographers had removed most of its internal mechanism including valves and many of these pictures were taken when it was reduced to "a test tube and piece of sealing wax". These lantern slides, the best I could obtain from the x-ray plates, still leave something to imagination.*

Here are two slides only of the renal pelvis. There are many others; but some are not of sufficient interest and others are altogether too much of the impressionistic school.

Plates 1, 2, and 3 right renal pelvis, left renal pelvis, transverse colon.

This young soldier complained of disabling pain across the small of the back, over frequency of urination by day and night and at times urgency even to incontinence on overholding his urine. Periodically he had acute pain in the right iliac fossa with vomiting, urinary tenesmus, and chills.

These symptoms he attributed to, and dates from, an accident five years before, when a block of wood was driven into the lower abdomen and he passed blood per rectum. Two laparotomies were then done but no further particulars were obtainable.

He was "pot-bellied". There was tenderness over both renal regions before and behind and over the fuller lower abdominal quadrants. The kidneys were not palpable in their usual positions and the lower abdominal muscles offered too much resistance to

* It has been found impossible to illustrate this paper from the lantern slides themselves. Resort to semi-diagramatic reproductions is therefore necessary.

Read before the North Pacific Surgeons' Association, Portland, Ore., December, 1919.

manual examination for one to get any information worth while by this method.

The *x-ray* revealed the right kidney occupying a position four inches lower than usual. Its pelvis, however, appears normal until contrasted with the left renal pelvis with its bizarre long upper calyx, longer lower calyces and smaller pelvis proper.

The left kidney was also prolapsed but to a less degree than the right. There was general enteroptosis as well, although the stomach specialist (Capt. Cleaver) found the intestines functioned properly.

The ache in the back and reflex urinary symptoms were due to drag on the renal pedicles.

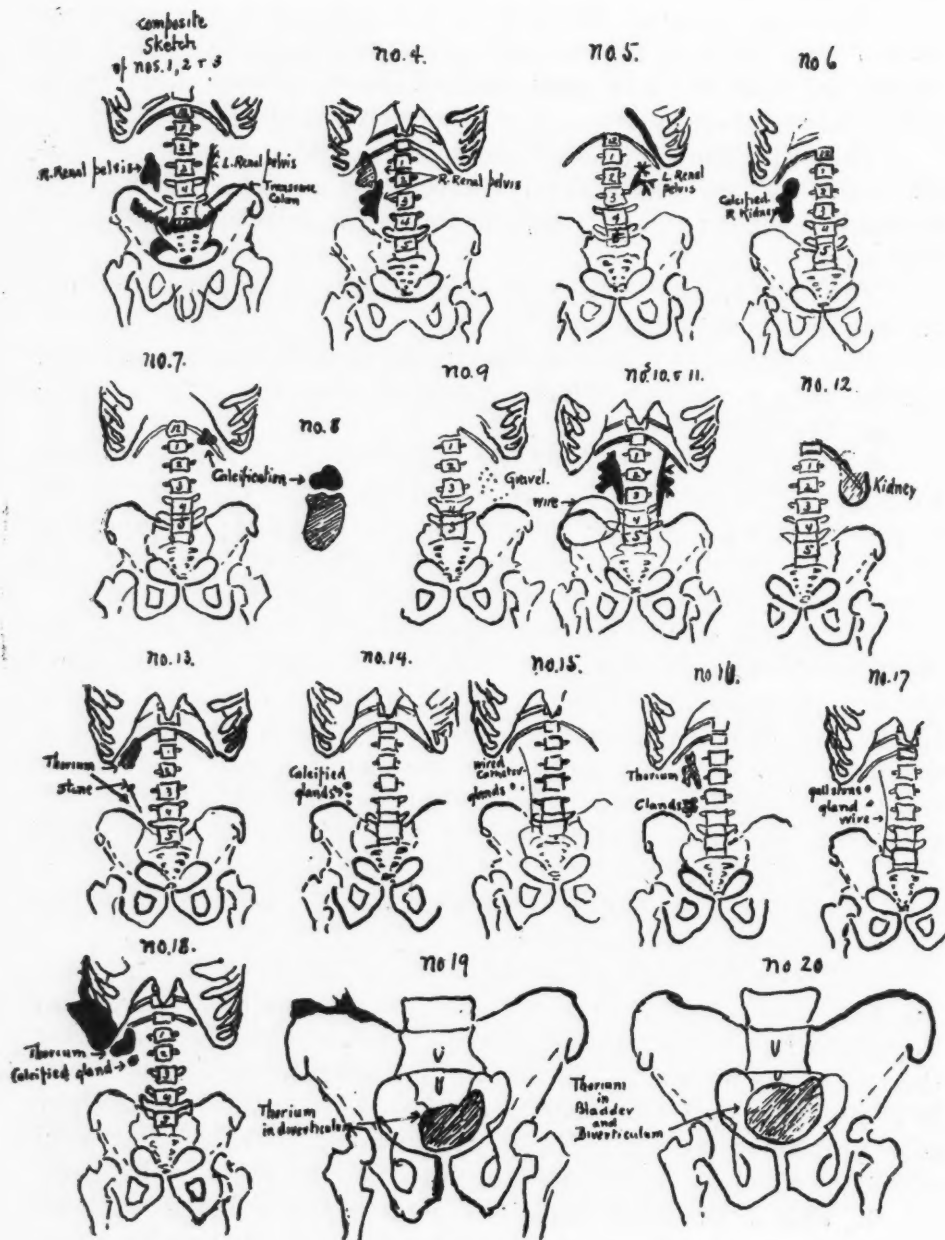
The right renal colic was due to the movable kidney at times getting into a position which interfered with the outflow of its urinary excretion.

4. This plate shows how the kidney position may vary with extraabdominal pressure. The dotted line shows the right kidney in place when an inflated rubber bag was interposed between the *x-ray* tube shield and the abdomen, the unbroken line (traced on from another plate) gives its place when no pressure was used.

These club-shaped calyces suggest septic erosion but no indication of when this occurred could be obtained from the man's history. It may have been that the pyelitis of infancy was at the bottom of it. During the time he was under my care no pus whatever was found on repeated urine examinations. I removed the kidney which proved to be nothing but a shell. The urinary symptoms this man complained of were so varied in essential details and contradictory that at one time he was looked on as very probably malingering. Unfortunately I do not know his history subsequent to operation.

5. The *x-ray* was instrumental in this case in excluding stone. The left renal pelvis and calyces were normal notwithstanding that this officer had two attacks of renal colic referred to this side during the two weeks he was in the hospital for other urinary complaints. It is probable that this colic was referred from the right kidney as its ureteral orifice was oedematous and would not admit a ureteral catheter before his symptoms subsided and he rejoined his unit.

6. This is the renal plate of a man who was being returned to Canada as an experienced farmer. He was forty-eight years old and had seen thirty-three months of service at the front. He was referred to my department, en route, to see if anything could be done for his general rheumatic pains, slow urinary stream, over-



frequency of urination and urgency to incontinence on overholding his urine. His father died of tuberculosis. He had tubercular posterior urethritis and prostatitis, and this plate reveals a calcified right kidney.

7. This is the left renal region of a man "buried" at Vimy two and a half months before and sent to our clinic with a diagnosis of fractured left transverse process of second lumbar vertebræ and renal calculi. His only symptoms were attacks of intimate hæmaturia and pain across kidneys which stabbed to the left testis at times—no pyuria was ever reported and he never had any symptoms of genito-urinary derangement whatever, although twenty-nine years of age, until Vimy Ridge battle. One sister died of tuberculosis.

8. Is an *x*-ray of this left kidney after removal. It is a similar kidney to the one depicted in Plate 6; but in this case the calcification was strictly limited to the upper pole and nothing but tradition held one from doing a partial nephrectomy.

9. This soldier's medical history sheet recorded that on two occasions he had had stones removed from the left kidney, and my assistant assured me that he had been present at the last operation and wondered at the time why nephrectomy was not done instead of nephrotomy. The patient complained only of a sinus in the loin which kept his back wet and required dressing. This plate shows crumbs of stone in the renal region. A thick slab of scar tissue was dissected out of the flank and in it were demonstrated the renal calyces to every one's satisfaction. The ureter was carefully tied off and the mass removed. On further inspection of the fundus of the wound a Staffordshire knot presented. This discovery I kept to myself; and afterwards reinspected the specimen removed only to discover that the supposed kidney was scar tissue only and its calyces diverticulæ of a sinus. This case is reported as one of those surgical varieties capable of demonstration at operation, although it is not there.

10. This young soldier had been in and out of hospitals for six months with diagnoses either of "right renal colic" or "nephritis". He had lost thirty pounds in weight and at times had had pus and casts in his urine; at other times the urine was reported free of all abnormalities for prolonged periods. He had never vomited and there was no record of a temperature over 99° 4'. At times there had been marked frequency, scalding and urgency of urination but there was no venereal history. At times there had been pain in the appendix region but usually the pain was located

in the right costovertebral angle area. A large somewhat movable mass with the outlines of a large kidney was palpable in the right lower abdominal quadrant. This was outlined by flexible wire, the right renal pelvis filled with thorium and an x-ray taken which suggested that the kidney could not form any part of the palpable mass.

11. The chief in surgery, however, was not convinced, and the pelvis of the left kidney was x-rayed. By contrast it appeared to have longer and slimmer calyces inviting the opinion that the right kidney was mobile and subject to internal intermittent back pressure. At the direction of the officer in charge of surgery an apparently normal right kidney was exposed; but the mass of dense scar tissue below it called for a general surgeon and he took over the case. In the centre of the mass which he dissected out was found a retrocaecal appendix. The condition then was chronic appendicitis with a spread of the infective micro-organism to the right renal pelvis. The urinary symptoms were reflex.

12. It was a red letter day for us when we got this plate showing the lower pole of the left kidney. A skilled operator with an up-to-date machine can duplicate it or do better on every exposure. Since my return I have seen even such soft tissues as the gall and urinary bladders outlined on x-ray plates.

13. The thorium in this case maps out a right pyonephrosis and the ureter up to a stone at the highest narrowing of the ureter. Between the stone and kidney substance no shadow appears indicating that the renal pelvis is contracted down to a passage only large enough to allow the thorium to pass up without volume sufficient to cast a shadow at this place. The kidney was removed by morcellement; but at that time the stone could not be found nor the passage to it made out in the dense sclerosed mass which occupied the position of the renal pelvis.

14, 15, 16, 17, and 18 are plates of calcified retroperitoneal glands which may easily be mistaken for urinary calculi. They probably originate in tubercular adenitis and often there is inflammation more or less acute surrounding them which involves the ureter and partially occludes it causing hydronephrosis. On the other hand the infecting agent passing through the lymphatics from this focus to the right kidney may set up pyelonephrosis or even pyonephrosis, so that the symptoms of these periglandular inflammations are often renal in character and the finding of opaque bodies in this neighbourhood by means of the x-ray leads to a mistaken diagnosis of stone.

14. This man's urine contained pus and blood and he suffered from typical renal colic. Diagnosis of extra ureteral obstruction was confirmed by laparotomy, when some of the calcified nodules were removed.

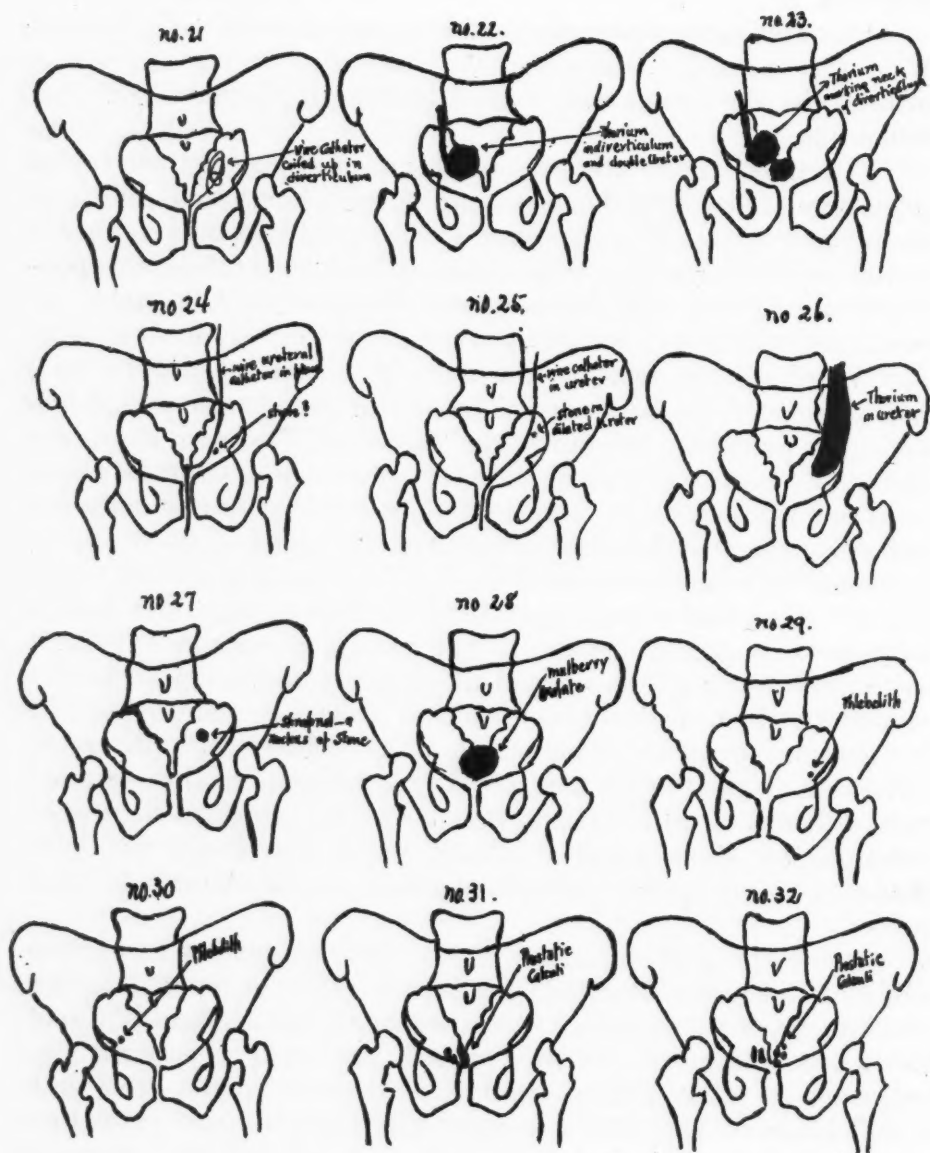
15. This man also suffered from typical renal colic but his urine was normal. Diagnosis was made by placing an opaque catheter in the ureter and demonstrating its distance from the concretion.

16. Shows the relation of such a group of glands to the renal pelvis when filled with thorium solution. On laparotomy, done by the officer commanding the unit, a retrocæcal appendix and some of the calcified nodules were removed, indolent tubercular peritonitis was found. There was no call for removal of the right kidney as the left kidney, bladder, and prostate were involved as well.

17. Shows the relation of a stone to a ureteral catheter in a man who had had right renal colic and in whose urine blood and pus were present. No operation was done overseas, but since this man's return to Canada I have some reason to believe that an attempt was made to remove renal calculus after another *x-ray* had demonstrated the same relation of this opaque body to the catheter. It was assumed that the stone was in a lower renal calyx. I do not think this was a case of renal calculus at all. The opaque body is more lightly shaded in the centre, a peculiarity of gall stones and on this plate (subsequently confirmed) are light opacities outside the line of the ureter which I take for calcified glands. In confirmation of this opinion plate, 18. Shows that the renal pelvis mapped out with thorium does not extend to the supposed renal calculus. Moreover nothing is more probable than that inflammation about calcified glands would extend by the lymphatics not only to the right renal pelvis but to the gall bladder as well.

19. Shows a diverticulum of the bladder filled with opaque solution. The case is interesting because the congenital bladder condition gave no obtrusive symptoms till after the man had had his abdomen peppered with shrapnel and then apparently infection of the diverticulum set in; also because on the other side of the bladder there was a congenitally stenosed and prolapsed ureteral orifice which had to be slit larger, and finally, because transplanting of the ureter on removal of the diverticulum, was followed by infection of the kidney on that side requiring nephrectomy.

20. This case shows the bladder outlined with opaque solution



in the same case. The irregularity in its outline is due to the full diverticulum showing itself beyond the bladder outline.

21. This shows a wired catheter which was fed up the opening of the diverticulum and coiled up inside it when an attempt was made to catheterize the ureter which opened into the diverticulum.

22. This is another collargol filled diverticulum. The dilated ureter which entered it at operation was found to be double barrelled.

23. This is of the same case the bladder filled first with opaque solution, let stand awhile and then presumably emptied by urination; but the plate shows residual solution in the bladder as well as a full diverticulum. This man after fourteen months of service at the front reported ill with undue frequency of urination, urgency, scalding and pain over the bladder and right kidney behind. The appendix had been removed but beyond the scar there was no palpable evidence of the condition and the urine was normal in every way including freedom from pus on repeated examinations.

24. Although this man gave a history of attacks of renal colic for many years his story was not very convincing and there were several inconsistencies in it. On one occasion a few pus cells were undoubtedly found in the urine from the left kidney, but voided specimens were repeatedly reported normal in every way. On x-ray the relation of the ureteral catheter to the pelvic opacity showing on this plate proved to our satisfaction then that he had no stone. I am not so sure now that no ureteral stone was present.

25. Shows a similar relation of catheter to an opacity, but 26, before taking which collargol was injected into the lower ureter demonstrated a pouch in which a stone could lie at some distance from a ureteral bougie in place and that such was the case was confirmed by scratches on a waxed bougie which was passed up. This soldier was anxious to return to his unit at the front and insisted on being marked grade "A". We held him only long enough to do a ureteral meatotomy through a cystoscope and hope that the next time the stone left its bed and engaged in the channel proper it passed through the enlarged ureteral meatus into the bladder and out with little pain.

27. Here is a bit of shrapnel about which stone has formed. It was left when the rest of his collection in face, abdomen, scrotum, and legs was removed and his attention was not directed to it till some weeks later when it tried to pass into the posterior urethra. It retreated then and when it was removed a year later we found it had grown an overcoat. This overcoat contains phosphates

and so I presume there was infection. I have an oxalate stone formed about a stitch passed through the bladder at herniotomy. I think the oxalate stones depend on blood for a matrix (especially the fibrogen part of blood)—the phosphates on a slime made up of mucinogen acted on by ammonia producing micro-organisms. I believe the matrix is the primary and essential factor in all stone.

28. Is a picture of a mulberry oxalate in situ in the upper division of an hour-glass bladder. I am passing it around. To cystoscopy this was a most astonishing stone. It seemed to float. One looked up towards the roof of the bladder to see it. Even the dense shadow shown on radiography was not deemed enough to clinch the matter and when the bladder was exposed at operation it was needled to determine if the thing were not a stone-encrusted tumor growing down from the apex. After removal some fleshy bits from its bed were reported to be papilomatous by Captain Fiedler, our pathologist. Some months later I had the good fortune to cystoscope this case again when a definite waist to the bladder could be clearly made out although it was not demonstrable at the cystotomy.

29 and 30. Here are two plates showing phleboliths. These vein stones are said to occur only in the plevic plexus and appear to be independent of phlebitis for an origin. They are found with increasing frequency from the fourth decade onwards and are demonstrable by the *x*-ray in most men over sixty. They are symptomless and so far as I can learn of no pathological significance.

31. This man had just had a whip bougie passed for retention and ureteral fever followed. Some years previously he had had atypical right renal colic and passed gravel. Later he had had gonorrhœa and more recently terminal hæmaturia. These opacities removed supra-pubically were some of his phosphate gravel lodged in the posterior urethra, pocketed and grown in situ to obstructive size.

32. This plate on the other hand depicts true prostatic calculi. There was no history of renal colic, no alkaline urine, and the "second glass" was free of pus. There was a history of chronic sclerosing prostatitis of many years' duration to choke the outlet of the prostatic ducts and cause retention and amalgamation of their contents.

THE SUMMER'S EXPERIENCE WITH INFECTIOUS DIARRHŒA

BY EDWARD A. MORGAN, M.B.

Toronto

THE presentation of this paper viz.: "A Summer's Experience with Infectious Diarrhœa," was prompted by a desire to present to the medical profession in general, in Toronto, and to the pediatricists in particular, some aspects of a disease which has been of considerable interest to myself and more or less of a puzzle in so far as its management and treatment was concerned.

Its greater prevalence in the city this year as compared with previous years has been remarked upon by several of you, and it has, therefore, become of more immediate interest.

In this contribution, you will find no attempt at original investigation, but merely a résumé and impartial criticism of the work done during the summer, in the hope of deriving from a rather hopeless confusion of figures some helpful hints as to the diagnosis, prognosis, pathology and treatment of infectious diarrhœa in early life. Owing to the fact that the decision to report these cases was not made until the last but one had been discharged from observation, the records are not as complete as I would have liked; for example, the failure in several instances to confirm bacteriologically the clinical diagnosis.

Infectious diarrhœa is, as its name implies, a bacterial infection of the mucous membrane of the small and large intestine, usually the ileum and colon caused by the ingestion of various organisms such as *B. dysenteriæ*, streptococcus, *B. coli*, and Welch bacillus, or by the lighting into pathological activity of one of the organisms normally present in the digestive tract. This infection manifests itself clinically by a diarrhœa characterized by frequent painful evacuations of the bowels, containing pus, mucus and blood, and by a toxæmia, as evidenced by pyrexia and prostration. Clinically, the diarrhœa caused by the various organisms is identical, varying only in severity, and it is impossible always to separate cases of

fermentative diarrhoea from those caused by bacterial infection, without bacteriological aid.

The difficulty in classification is due not to the fact that fermentative diarrhoea may simulate infectious diarrhoea, but to the fact that mild cases of dysentery may pass unrecognized owing to the absence of pus or blood in the stools. It is these mild unrecognized cases which are, not improbably, responsible for the spread of the infection when it is seen in the epidemic form.

In the series of cases presented, eight were proven bacteriologically or serologically to be cases of true dysentery. In three others the only gram-negative bacillus isolated was *B. coli*. In none was the infecting organism proven to be a streptococcus or *B. Welchii*. There were in all eighteen cases, and a brief summary of their records from an ætiological, clinical and pathological standpoint, reveals a few facts of interest.

Ætiology. An effort was made to discover an adequate explanation for the increased prevalence of the disease in the city during the past summer, and also a clue as to a common source of infection for all the cases. The increased incidence noted recently of communicable diseases, such as purulent gingivitis (or trench mouth) and venereal disease, due to return from overseas of infected men prompted the assumption that the much maligned returned man was responsible for the increase of dysentery.

Investigations along this line were, however, unsatisfactory and unconvincing. Surprisingly few cases had, previous to the onset, been in contact with returned soldiers and in no instance was a direct contact with a convalescent dysentery case proven. When, however, one considers the chief methods of transmission of infection of this disease it becomes obvious that personal contact plays only a very small part, and I am still convinced that the most rational explanation is the presence in the community of returned soldier dysentery carriers.

Zinsser¹ and Smillie² have separately shown the possibility of transmission by food stuffs, and Lucas and Amoss³ during an epidemic of infectious diarrhoea actually caught the flies red-handed with viable dysentery bacilli on their bodies. The majority of observers are agreed that the common house-fly is the most frequent cause of the spread of the infection basing their belief on the continued prevalence of the condition during the later summer months, when the heat is not excessive but flies are still numerous. In this series, eleven cases occurred in July, four in August, and four in September.

From a study of records kindly furnished me at the Meteorological Office, it appears that 55 per cent. of the cases occurred during the months having the highest average maximum temperature, 85°, the highest monthly mean temperature, 73°, and the lowest mean humidity 68°. This was July.

An attempt was made to establish a common source of food supply in these cases, but with no result. In one house, for instance, where four cases occurred, it was impossible to find even one article of diet which was common to all four. Three cases gave a history of having eaten ice-cream cones, two or three days previous to the onset, and three others had eaten fresh fruit procured from the local fruit shop. Both these food stuffs have been shown by other observers to be the medium of transmission of infection. No grouping of the cases into one locality or nests of infection could be demonstrated, the infected houses being scattered indiscriminately throughout the city, only two being on the same street. It is interesting that in nine instances there were two or more cases in the same house.

Age incidence. Only five were under one year, four between one and two; five between two and three, and five over three years. The small percentage of infants explains the comparatively low mortality for the series, viz.: 31·6 per cent.

Symptoms. The onset was abrupt in 90 per cent. and was characterized by vomiting in 60 per cent.; diarrhoea, 100 per cent.; blood in stools, 80 per cent.; convulsions 20 per cent. The history relating to pus in the stools, fever, and tenesmus was too indefinite to be worth recording. Whilst under observation all cases had pyrexia of greater or less degree, depending on the severity of the infection. It has been shown by other observers that the prognosis can be based in some measure on the height of the temperature, and the rule held good in this series. Four cases in which the maximum temperature was 101° or less, recovered. In five cases where the temperature rose to 103° the mortality was 20 per cent.; and of nine patients whose temperature registered over 103°, 55 per cent. died. For the purpose of comparing the mortality of fermentative diarrhoea with the infectious form, eighty-two consecutive cases of the former type admitted to the wards of the Hospital for Sick Children, during July and August, were tabulated. The mortality was found to be 43 per cent., but it should be noted that the average age of these patients was much below the average in the series of infectious diarrhoea. The same relationship between the height of the fever and the mortality does not exist to the same

extent in the Fermentative group. Vomiting during the course of the disease was present in 30 per cent., but was excessive in only 16 per cent. The spleen was slightly enlarged in 10 per cent. As an aid in diagnosis, the blood count is of questionable value. All the blood examinations in this series were made in the first week of the disease. The lowest total count was 7,600 per c.mm., the highest 18,600; the polymorphonuclear percentage ranging from 37 to 71. The average total count of uncomplicated cases was 10,000, and average polymorphonuclear percentage 59. These figures tally with those obtained by Bloom⁴.

Blood cultures were made in three cases, and, as was to be expected, were sterile. The invasion of the blood stream by dysentery organisms has been reported by several investigators, but it is a very unusual occurrence.

Stools. The character of the stools is typical of the condition. During the first three or four days there are numerous evacuations containing blood, and clear or slightly turbid mucus, with little faecal material, and accompanied by tenesmus. After this period the mucus changes to pus, and faecal matter begins to appear. The reaction is usually alkaline to litmus. In eight cases tested in this collection, only one stool was acid to litmus.

I should like to emphasize here that the direct smear of the stool stained by Gram's method is very typical of the disease, and where conditions do not permit a culture being made, a fairly accurate diagnosis can be achieved by the clinical signs, reaction of the stools, and a study of the direct smear. Numerous pus cells are seen with very few organisms, the latter being mainly Gram-negative bacilli, a few streptococci and occasionally Gram-positive bacilli.

Bacteriology. In spite of the enormous amount of work done to determine the bacteriology of infectious diarrhoea, the results obtained have been conflicting. In this country, the most thorough investigation was done by Kendall, Walker, and Smith of Boston^{5, 6, 7, 8}. They conclude that any one of the following organisms may be the cause of dysentery or infectious diarrhoea: (1) *B. dysenteriae* of Flexner; (2) The Shiga type; (3) *B. aerogenus capsulatus* or Welch bacillus; (4) *B. coli* and (5) streptococcus. Their deductions are based on the isolation of any one of these organisms from the stools. Since, however, *B. coli*, streptococcus and the Welch bacillus are frequently found in the dejecta of normal bottle-fed infants, or children on a mixed diet, the preponderance of one of these organisms in a diarrhoea stool does not *per se* justify the conclusion that

it is the exciting cause of the diarrhoea. The performance of serological tests, such as agglutination reactions or complement fixation tests would have materially strengthened their position. There is, however, a diversity of opinion as to what dilution of serum giving a positive reaction should be considered as being within the normal limits, two observers placing the diagnostic limit for the Flexner organism at 1-250.

Dr. Graham, Professor of Department of Medicine, who has done a great deal of work along this line, while attached to the Salonica Forces, summed up the opinion prevailing at present in a recent personal communication. Firstly, failure to isolate *B. dysenteriae* from stools even after repeated attempts does not mean that this infection can be ruled out. After the first week of the disease, when stools contain faecal material, it becomes increasingly difficult to obtain the dysentery bacillus by the ordinary culture methods. It is this well recognized difficulty which tends to throw doubt on the work of those observers who report diarrhoeas caused by such organisms as Gaertner's bacillus, Morgan's bacillus, or *B. aerogenes capsulatus*. Secondly, failure to demonstrate specific agglutinins in the blood serum is not a final test, since the intensity of the reaction depends entirely on the strain used. Thus a strain, the titre of which has been worked out by personal experience gives the most uniform results.

Agglutination tests were done in eight cases in this series, using both a Shiga and Flexner strain. Five showed reactions which were of diagnostic significance; two of them agglutinating the Flexner organisms in dilutions of 1-160 or higher, one at 1-80, and one agglutinated the Shiga bacillus at a dilution of 1-640.

There was a certain amount of co-agglutination between the two strains. To obtain a standard for these two agglutinogens, the blood of ten normal children was tested. In only two instances did a reaction occur in dilutions higher than 1-20, and none higher than 1-40.

Pathology. Three cases came to autopsy, and two of them showed fairly typical lesions. None of the three cases had been proven bacteriologically or serologically to be dysentery.

Case 4 showed a broncho-pneumonia, acute glomerular nephritis, pseudomembranous enteritis, and superficial ulceration in ileum and colon.

Case 6. A broncho-pneumonia was found, and, to quote the autopsy records written by Dr. Erb, attending pathologist to the hospital: "The mucous membrane of the lower three feet of ileum,

and the whole of the colon is covered with a yellowish pseudo-membrane which on removal reveals a granular reddened surface, which appears to be ulcerating. The membrane is removed with considerable difficulty. Solitary follicles and Peyer's patches not enlarged. Mesenteric lymph nodes pale and much enlarged.

Case 7 showed an acute nephritis, broncho-pneumonia, and, in the last foot of the ileum and the whole of the colon, scattered areas of inflammation of mucous membrane."

Treatment. As far as concerns the management of infectious diarrhoea in infants, there are two distinct schools of teaching on this continent. Their views are so diametrically opposed that it seems improbable that both can be right. The Boston school bases its treatment viz.: the exhibition of lactose, on certain fundamental biochemical and bacteriological principles. The opposing school bases its treatment, viz.: administration of protein milk, on no sound theoretical principles, but merely on the assumption that if protein milk is of value in most cases of diarrhoea, it ought to prove of value in all of them. The work done by Kendall in Boston is convincing and very instructive, and I will endeavour to give you an outline of it as compactly and comprehensively as possible.

1. During a period of starvation, sugar which has been stored up in the liver in the form of glycogen is rapidly exhausted. When it is finished, protein metabolism commences. This sugar, therefore, acts as a protein sparer.

2. It can be readily shown by a simple laboratory experiment that members of a certain group of bacteria, amongst them being *B. dysenteriae*, if inoculated into media containing both a protein substance and a fermentable carbohydrate, will attack the carbohydrate first, and when this is finished, but not before, will attack the protein, break it down, and liberate toxic products of putrefaction. In other words, fermentation takes precedence over putrefaction when both carbohydrate and protein are present in the media in which the organism is growing.

3. The specific toxin of the bacterium is produced, most readily in an alkaline medium containing protein.

4. Formation of lactic acid, as one of the end products of fermentation tends to inhibit the growth of the *B. dysenteriae* and streptococcus.

Adopting these known facts as a basis for treatment the patients were furnished with a solution of an easily assimilable, readily fermentable carbohydrate, viz.: lactose, with the belief

that the patient would be benefitted in three ways (1) By a diminished absorption of the products of protein decomposition; (2) By the ingestion of a readily assimilable food; (3) By the inhibition of the growth of the putrefactive organisms and of the formation of specific bacterial toxins, as a result of the production of lactic acid.

Theoretically the treatment is sound and practically it has stood the test, judging from the results published by Kendall, Bowditch⁹, Morse¹⁰, and others.

After reviewing the work and conclusions of these observers, it is very difficult to justify the use of protein milk in the treatment of this disease, and I believe that we have been, to say the least, ultra-conservative in that we have not even given the above treatment a fair trial.

In this series, eighteen cases were fed protein milk as soon as they came under observation and were kept on it for a period varying from one to forty days. The other case was given boiled skimmed milk and decided improvement in the character of the stools was noted in eight days. This was an exceptionally mild case of proven dysentery in an older child, the temperature never rising about 100°. With several of the patients the protein milk was temporarily discontinued and other foods such as skimmed milk, junket, and cereals, etc., were tried with no apparent change in frequency or character of the stools. Colon irrigations were given in four instances without obvious beneficial effect. Repeated injections of normal saline or 5 per cent. glucose solutions were administered, hypodermically, intravenously or intraperitoneally in twelve cases in which dehydration had to be contended with. The value of this procedure was not sufficiently emphasized by the Boston school, but it is unquestionable.

Specific antitoxine therapy was not employed in any instance, as it was found impossible to procure the serum, but good results are reported with its use.

The literature contains many reports of the successful use of autogenous vaccines and when the antitoxic serum is not available, they should be tried.

It is impossible to go into each case in this series, in detail, but the clinical histories of one or two are instructive.

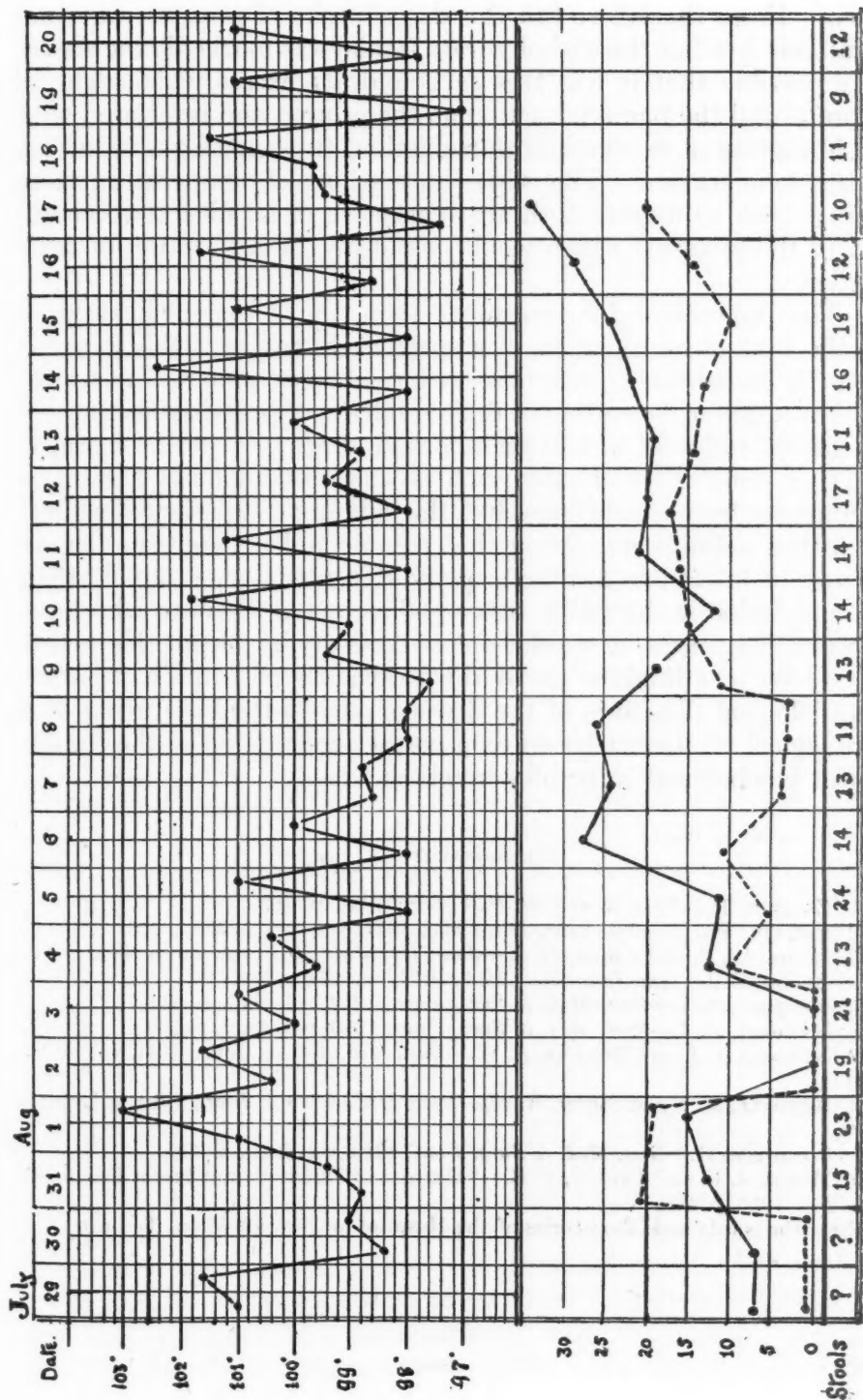
Case 1. Male, age five months, was given protein milk mixture, half-strength, on admission. His temperature was then 98°, but rose in two days to 104°, when death occurred, ushered in by meningeal signs suggesting a profound toxæmia. The examination of the spinal fluid was negative.

Case 2. Male, age five years. Given on admission full strength protein milk, and twenty-four hours later barley gruel which was kept up for another five days. His temperature on admission was 100° , but reached normal on the eighth day. The stools decreased from sixteen to five per diem in four days whilst on barley gruel.

Case 3. Female of nine months was given protein milk twelve hours after admission, and this food was not changed for thirty-nine days. For twenty-two days her temperature fluctuated between 99° and 103° and stools averaged five per diem. She ultimately recovered.

Case 19. Female, age six months, is still under observation. Protein milk two-thirds was given on admission, and child was on this food for fourteen days; the temperature during that period fluctuating between 99° and 104° . Five per cent. lactose solution was then given by mouth and daily hypodermoclyses of glucose solution. The day following the administration of lactose the temperature dropped to 99° , and hovered around this point for four days, when it suddenly rose to 102° , and then dropped to 98° , where it stayed for two days. The stools diminished in frequency for the first four days following the exhibition of lactose and a direct smear of one of them, stained by Gram's method presented a picture which is considered typical, viz.: the disappearance of the Gram-negative bacilli, and streptococci, and the reappearance of numerous Gram-positive bacilli of the *B. acidophilus* type. Two attempts have been made to isolate *B. dysenteriae* from the stools of this patient without success.

Case 17. Female, age four years, a proven case of dysentery, was sick eight weeks, the pyrexia persisting for five weeks. The food was changed many times, protein, klim, skimmed milk, barley gruel and soft diet, all being tried. The chart which I will shew is instructive in that it pictures the temperature curve of an uncomplicated case of true dysentery of unusual severity and duration. In it, I have endeavoured to shew a relation between the daily protein intake and the height of the pyrexia. The stroked line in the lower part of the chart represents the number of grams of protein ingested each day. The solid line represents the daily carbohydrate intake. It will be seen that in some measure the curve of the protein intake follows the temperature curve above; for instance, a drop in the pyrexia on July 29th and 30th when only barley water was administered; a sharp rise to 103° following feeding of protein milk on July 31st, a gradual reduction of temperature from the 1st of August to the 4th, when nothing but water was



given. From the 5th to 9th the daily intake of protein was comparatively low but the carbohydrate intake was markedly increased. It is possible that it was this carbohydrate excess which delayed or prevented the bacterial action on the protein and interfered with the formation of products of putrefaction, thus causing a reduction of the temperature. The wide fluctuations of temperature from August 10th to August 20th are suggestive of an ulcerative condition in the intestine which would facilitate the absorption of toxic products.

The indications for treatment then are (1) neutralization of specific toxins by injection of a specific antitoxine if this is available; (2) correction of dehydration by saline or glucose injections; (3) prevention of formation of toxic products of protein putrefaction by administration of a food rich in carbohydrate; (4) specific therapy.

In a small series of cases such as this it is obviously absurd to attempt to draw conclusions, but the summer's experience has left me with a definite conviction that protein milk is contraindicated in cases of infectious diarrhoea of the dysentery type, and I think this conviction is shared by other pediatricists in Toronto who have followed these cases, or similar ones. It is my hope that this report may serve to stimulate us to the formation of a more accurate bacteriological diagnosis of the disease, and to the institution of a more logical treatment based on a correct conception of the fundamental biochemical principles involved.

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From the wards and laboratories of the Hospital for Sick Children, Toronto.

THE NEED OF PSYCHOPATHIC HOSPITALS IN CANADA

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Montreal

THE Great War brought to the attention of the medical profession and general public the fact that the mental aspect of each person had to be earnestly considered in the relation of that person to the general public. Neuropsychiatry made great advances during the four years of the war. At first, England, France, Germany, Canada and the other countries who were drawn into the conflict right from the start did not, owing to their unpreparedness, fully realize the importance of the mental make-up of each man who was called upon to defend his country. By the time, however, that the United States declared war on Germany and her allies, there were so many cases of "shell shock", mental deficiency and mental abnormality who were clogging the progress of the army as a fighting unit, it was realized by the Government of the United States that these misfits must be culled from their army before it was sent to France. For this purpose the United States already had an organization—The National Committee for Mental Hygiene—which could handle the problem. Dr. Thomas Salmon, medical director of this committee, was asked to assume the task of organizing this branch of the army medical service with the result that there was a neuropsychiatric unit attached to every important mobilization centre. Thousands of men suffering from mental deficiency, psychoses and insanity were rejected. In France, neuropsychiatric centres were established behind the lines where all incipient cases of mental abnormality were promptly treated and not allowed to lapse into a chronic state.

Canada, like England and France, was slow to realize the importance of these mental cases, but during the last years of the war, more attention and care was given to them. At first many cases, owing to the fact that these cases of psychoneuroses were not fully recognized in the beginning, were evacuated to England and the depletion of man power in the front line from this cause

became a very serious item. The first really systematic effort to handle this problem in France was the establishment of special neurological hospitals in the casualty clearing lines. The work done in these special hospitals was very effective.

The Canadian Army Medical Service was the first to organize a special hospital for the treatment of these cases of psychoneuroses. In November, 1915, a hospital was established at Ramsgate under Dr. C. K. Russel. In this hospital, under proper treatment, striking results were obtained. When Dr. Russel was recalled to Canada, he was immediately called upon to organize hospitals for the special treatment of these cases of psychoneuroses who were evacuated from England to Canada. In all the large cities of Canada these hospitals were established and one has only to read their reports to see that the work of Dr. Russel and his staff has been of exceptional value to our country.

There was also opened at Cobourg, Ontario, a hospital for the definitely mental cases and when we read in their report that 58 per cent. of the men who were sent there as chronic cases have been returned to civilian life, we realize the value of modern treatment of such patients.

Now that the war is over, are we going to lapse back to the pre-war conditions in which our mental patients were given no treatment whatever, or when they had become dangerous to society, were given mere custodial care in the provincial asylums? No, I do not think we are, but the medical profession, the general public and our legislators require a lot of education before they will see that adequate attention and treatment are provided for mental patients. The present attitude of the medical profession is one of *laissez-faire*; they are still living in a world of physical disease; they cannot see that the future progress of our country depends on a higher mental development in the citizens of Canada; they cannot see any hope of doing any good to a person who is suffering from mental abnormality and some of our physicians, I am sorry to say, do not show any desire to be shown that progress has been made in the treatment of mental diseases.

What then should be the first step in the development of caring for our mental patients? The answer is "*the establishment of psychopathic hospitals in all the large cities of Canada.*" Before, however, discussing the advisability of such hospitals, let us see what has been the experience of the medical profession in the United States.

Psychopathic hospitals in that country have now been in opera-

tion for a number of years; they have been well received by the public and are generally looked upon as being well past the experimental stage. The soundness of the general principles which led to their establishment is not now in question. The State Psychopathic Hospital at the University of Michigan was opened in 1906, the Psychopathic Department of the Boston State Hospital in 1912 and the Phipps Psychiatric Clinic at the Johns Hopkins Hospital in 1913. Various others have been established since that time and more are contemplated.

These psychopathic hospitals in the United States have been successful as proved by the fact that there is a demand for one in nearly every state in the Union. The response of the public to the opportunity offered of obtaining expert advice on matters pertaining to mental hygiene in the out-patient departments has been particularly gratifying. These hospitals have been largely responsible for the adaptation of social service methods to hospital work and now social workers are considered indispensable in institutions conducted on modern lines. The number of patients that are restored to the community by the psychopathic hospitals without a resort to legal commitment or the necessity of a protracted state hospital residence represents a financial saving which is well worthy of the careful consideration of economists who have not always been influenced by the purely humanitarian aspects of this important problem.

What are the functions of a psychopathic hospital? The following quotation from the twelfth annual report of the Massachusetts State Board of Insanity fully covers these functions:

"The psychopathic hospital should receive all classes of mental patients for first case, examination and observation, and provide short, intensive treatment of incipient, acute and curable insanity. Its capacity should be small, not exceeding such requirement.

"An adequate staff of physicians, investigators, and trained workers in every department should provide as high a standard of efficiency as that of the best general and special hospitals, or that in any field of medical science.

"Ample facilities should be available for the treatment of mental and nervous conditions, the clinical study of patients on the wards, and scientific investigation in well-equipped laboratories, with a view to prevention and cure of mental disease and addition to the knowledge of insanity and associate problems.

"Clinical instruction should be given to medical students, the future family physicians, who would thus be taught to recog-

nize and treat mental disease in its earliest stages, when curative measures avail most. Such a hospital, therefore, should be accessible to medical schools, other hospitals, clinics and laboratories.

"It should be a centre of education and training of physicians, nurses, investigators, and special workers in this and allied fields of work.

"Its out-patient department should afford free consultation to the poor, and such advice and medical treatment as would, with the aid of district nursing, promote the home care of mental patients.

"Its social workers should facilitate early discharge and after care of patients, and investigate their previous history, habits, home, working conditions and environment, heredity, and other causes of insanity, and endeavour to apply corrective and preventive measures."

Canada has, at present, only one psychopathic hospital. This year, following out the recommendations of the Canadian National Committee for Mental Hygiene, the government of the Province of Manitoba established a psychopathic hospital in connection with the Winnipeg General Hospital under the directorship of Dr. A. T. Mathers. This hospital has already done valuable work among the mental abnormal patients and now no case of insanity or mental deficiency can be sent to an institution without first being observed in this department.

In Toronto a reception hospital for all cases of mental abnormality is to be built shortly and when completed will have charge of all the mental patients along similar lines to the Psychopathic Hospital in Winnipeg.

Montreal and Toronto have already psychiatric outdoor clinics where patients can come voluntarily or be sent by the different social organizations in these cities and obtain outdoor treatment. The Toronto Clinic, at the Toronto General Hospital, has been in operation since 1914 and during that time has observed and treated over 4000 cases. In Montreal, the clinic, which was started in March of this year, is in connection with the Royal Victoria Hospital, and has already seen a large number of patients. In these clinics each patient is examined by a psychiatrist, neurologist and psychologist as well as given a thorough physical examination, and a full report on the patient's environment, and heredity is provided by a trained social worker.

Many patients do not need institutional care, but with the help and advice of the physician and social worker are able to live their lives under restrictions.

The public school boards are also finding that a mental examination of their scholars is important. For many years the teacher has been handicapped in her work by having in her class mentally defective children, those suffering from dementia præcox or the super-normal child. Now that special classes are being provided, as in Vancouver, for these different grades of children, it is observed that the normal child progresses more rapidly. On the other hand, the defective child also improves more quickly and there are fewer cases of delinquency.

Canada is at present beset by many perplexing problems but, unless we take stock of the mental status of our citizens, these problems will increase rather than diminish. Until the Great War made us realize the importance of the mental make-up of persons, we were satisfied to send our insane to institutions where they obtained mere custodial care, or allow our feeble-minded to wander about the country and shift for themselves. This policy has been a very costly one as anyone can prove by visiting our courts and penitentiaries. A policy which should have all our criminals, juvenile delinquents and prostitutes examined in a modern psychopathic hospital and then properly cared for would in the end prove a far less expensive one. Then, also, there are a large number of persons who, at present at the first appearance of a mental breakdown, have to be sent to the asylum and there so often become chronic cases, while if they were able to obtain suitable treatment in a psychopathic hospital, would be able to return to their friends and live a happy life.

Mental disorders are grouped under three headings: (1) Mental deficiency or feeble-mindedness; (2) mental disease, or insanity; (3) psychopathic conditions. The difference between the first two classes is that mental deficiency is a defect of the brain while insanity is a disease. A psychopathic individual is one who is afflicted with such disorder of personality that he often becomes a social problem but is not classified as insane.

No accurate information concerning the number of mental abnormals in Canada can be given as no comprehensive surveys have been made in Canada. If, however, we use the figures of the mental examinations made in the United States Army as a basis for percentage, there are upwards of 160,000 mental and nervous unfits in Canada. In the city of Toronto it has been figured that .6 per cent. of the population is mentally abnormal. Out of 10,000 school children examined in Toronto, slightly over 2 per cent. were found to be abnormal.

The cost of mental abnormality to Canada has never been accurately computed. In the United States, Dr. Abbott of Belmont, Mass., figured that it cost that country, in 1910, \$33,000,000 to care for 200,000 patients who were then in institutions. The economic loss due to their being unable to work was estimated at more than \$130,000,000 annually—being equal to the value of the combined exports in 1910 of wheat, corn, tobacco, dairy and beef products. If such a basis can be taken for Canada, our annual loss, due to insanity is over \$13,000,000, when we take mental deficiency and psychopathic conditions into account, the total cost would be more than \$26,000,000. It is probable that about 60 per cent. of our criminals belong to the mentally abnormal group. In the Province of Manitoba, where all the inmates of the gaols in October, 1918, were examined, 60 per cent. were found to be either mentally deficient, insane or psychopathic. Dr. Bernard Glueck, after a study of six hundred odd consecutive admissions to Sing Sing Prison, reported that 12 per cent. of the prisoners were insane, 28.1 per cent. intellectually defective, and 18.9 per cent. were psychopathic.

As far as juvenile delinquency is concerned, it can be stated that upwards of 30 per cent. of all chronic cases are abnormal. This percentage is based on a study of a consecutive series of cases appearing before the Winnipeg Juvenile Court; of a study of the inmates of a Manitoba industrial school for delinquent boys; of the figures from the Psychiatric Clinic, Toronto General Hospital; and of the writer's findings in a study of the boys at the Boys' Farm and Training School, Shawbridge, P.Q.

Mental abnormality also plays a prominent rôle in prostitution and illegitimacy. Recent studies conducted in Canada and the United States show that upwards of 60 per cent. of all prostitutes are of defective mentality. Out of three hundred cases of illegitimacy studied in Toronto and Winnipeg, over 80 per cent. were found to be feeble-minded.

All of these facts and figures point to the urgent need of psychopathic hospitals in our large cities where these cases could be diagnosed, given proper treatment and cared for so that they would no longer be either a menace or a hindrance to the community. Economically also it will pay our country to look after properly the mentally abnormal person.

MEDICAL BOARD WORK ON PSYCHIATRIC CASES.

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THE work of a psychiatric medical board charged with the duty of making recommendations and decisions is very exacting. Its function consists not only of accurately describing cases for the purpose of permitting an estimate of the pensionable disability, but also determining the candidate's civil rights and freedom, a power comparable to that of a court of law. The many and varied problems of such a tribunal also involve the recommendation for the disposal of patients and the prescribing of treatment.

Since the opinions expressed are so important and far-reaching, observations are carried out over a period of three to six months. Few cases are disposed of before the expiration of this term. During such an interval, not only are many physical disabilities cleared or corrected, but mental derangements, if at all amenable to treatment, are frequently improved and in many cases cured. At irregular intervals, to avoid any preparation for examination or excitement by the patient, he is summoned before the board, his progress noted and if the individual is not ready for disposal, one or more of the various forms of treatment is prescribed.

It is a significant fact that of more than fifteen hundred cases that have passed through this institution, prolonged observation has reduced to almost nil the number of cases with an unsuitable recommendation for the mode of disposal. No serious incidents have come to light in the after history of ex-patients that have in any way tended to reflect discredit on the decisions made. That a careful decision must be made in each individual case will be recognized when it is recalled that approximately fifty-five per cent. of the cases that have passed through this institution were discharged to civil life and the remaining forty-five per cent. to custodial care.

When the treatment has reached finality, the condition sta-

tionary, or the means of disposal decided, the patient's condition is described on the well-known militia form B. 227. In a detailed consideration of the answers to questions on this form, it will be obvious that they differ materially from those referring to a case simply having a physical disability. Thus in the study of "the original disease", the board frequently find that a retro-diagnosis has to be made. This is not in any sense derogatory to a previous medical board's opinion. Though many of these diagnoses, hastily made overseas amid the rush and turmoil of war, have been confirmed here, in most cases they have had to be revised. Such revisions, of course, were made only after prolonged observation, which was not possible nor convenient overseas. The other factor, prominent as a cause for the change of diagnosis, is the English classification of mental diseases. Such terms as confusional insanity and delusional insanity found no place in the Kraepelin classification, which is the classification most commonly used on this continent and in use throughout the C.A.M.C. Though the Clouston terminology has long been obsolete in this country, it is still in use by the R.A.M.C.

The determination of the cause of the disease in mental cases is a question which is not so easily or definitely answered as in physical disabilities. It is a significant fact, however, that exceedingly few psychoses are directly attributable to the war. The majority of psychic diseases observed in returned soldiers have been of a constitutional origin. Frequently, we have been able to obtain from relatives or friends the statements that the patient was always "peculiar" or exhibited definite psychological disturbances. In fact, in a fairly good percentage of cases, a definite asylum admission history was obtained. In others, the period of origin of the disturbance had to be based on the history of the man's progress in the army or on the clinical picture, and general demeanour presented at the time of examination. As in ordinary civil life, heredity, toxæmias and alcoholism played an important part as causative factors. The psychoses of the war did not add anything new to the types of mental diseases known, and practically all cases have fallen into the ante-bellum classifications.

The resumption of the former trade or occupation by the men returning to civil life is in the majority of cases an easy matter to settle. Those requiring custodial care give little concern about their former work, for they are obviously unfit. The bulk of soldiers presenting a psychic disturbance have been observed to be individuals of mediocre mentality and have thus engaged, prior to their military careers in occupations requiring little skill. Hence,

such men have little difficulty in resuming their former employments such as labouring, farming, or occupations of a menial nature. Of course, one cannot overlook a certain percentage of intelligent men who have recovered from a psychosis in the army. On account of the thorough training and proficiency exhibited by such convalescents prior to their army life, they also have little difficulty in returning to their former vocations.

Having considered all of the foregoing factors, the board still finds that the proper disposal of a patient is most difficult to decide. The usual recommendations for discharge in cases of physical disability such as "on demobilization as medically unfit", or "medically unfit" are in these cases of psychiatric diseases entirely insufficient. The decision as to the manner of a patient's disposal must be based on the consideration of the following questions:

First—Is the man fit to be at large and self-supporting?

Second—Is the man fit to be at large and only partially self-supporting?

Third—Is the man mentally unfit to be at large, dangerous to himself or others?

Such questions have evolved a systematic method of recommending disposal of mental cases. Those in the first category are discharged to *civil life under their own control*, whilst those in the second are discharged to *their own control with supervision by the Department of Soldiers' Civil Re-establishment*. This latter recommendation is made in the case of an individual, who with a little help or advice from a social service worker, assisting him in finding employment or enabling him to decide some of his problems of re-establishment, can be self-supporting. Men coming under the third category are discharged to asylums for *custodial care under the Department of Soldiers' Civil Re-establishment*. Under this heading are included certain men who, prior to civil life, presented a definite psychosis, which was not aggravated on service. Such men could have been weeded out only by a competent military psychiatric service. This recommendation, to confine a man to an asylum who previously had his freedom, without his disease having become worse, seems at first rather striking. These individuals, however, were really never efficient in private life, and were always either actually or potentially a source of crime and delinquency. During peace, there was no method whereby such cases could be brought to examination in large numbers and committed to institutions.

The United States, during their recruiting, rejected approxi-

mately fifty-five thousand men as mentally unfit. This of course meant an enormous saving to their country. Steps, however, were not taken to observe or commit many of these men who should have been segregated. Though the Canadian army, on account of the urgent demands for fighting divisions, could not require a mental examination of every individual, and had to admit many that could otherwise have been rejected, the expense was not in vain, for Canada benefitted by having its civilian population improved through the large number of insane committed to asylums. Such commitments were possible only after observation, which was easily carried out during their army life. Frequently, latent psychopathic tendencies were not manifested until the change from civilian to military life occurred. Careful study of many cases of pre-enlistment psychosis has proved conclusively that these men, though on discharge fit only for custodial care, have really not suffered any aggravation during service and have therefore no pensionable disability. Such decisions have aroused some criticism from friends and relatives, especially those seeking a pension. Nevertheless, a review of one or two cases will serve to prove the justice of the opinion held by the board.

1. Private L. H. S., age thirty-three, labourer, was admitted to Cobourg Military Hospital, October 29th, 1918, from *H.M.S. Araguaya*. Overseas documents stated, "He was throughout very irresponsible wandering about without object, and repeatedly asking for transfer to different units. Showed lack of appreciation of discipline and was a general nuisance. Was continually under arrest for his irresponsible acts and breaches of discipline." On admission was found to be physically fit. Mentally, he showed defective orientation for time. His judgement and intelligence were of an exceedingly low standard. His mental age was estimated between eight and nine (Princeton scale). On December 21st, 1918, he was transferred to an asylum for custodial care.

2. Private X. L., age thirty-seven, labourer, was admitted January 12th, 1919. He was a draftee under the military service act, April 24th, 1919, and after several months in England was found mentally unfit for the army. On examination, he showed no physical disability, but numerous stigmata of degeneracy, viz.: high arched palate, deformed ears and a heavy massive expression with low receding forehead. He was totally illiterate, simple and childish. His mental age was between six and seven (Princeton scale). During his stay at Cobourg he was frequently the subject of periods of imbecile excitement. He also showed a psychopathic

heredity, having two insane relatives. He was discharged July 21st, 1919, to custodial care.

It is obvious that in both cases there existed no military liability, as the disease, congenital in origin, was one of feeble-mindedness. Apart from the temporary excitement that existed whilst in the ranks, for such men were always the "goats" of the unit, there remained no aggravation of their psychoses. Nevertheless, the relatives of both these soldiers, though granting that the present diagnosis was correct, maintained that the patient's disease was greatly intensified on service and that they were entitled to a pension. To safeguard the interests of the public and do justice to the men who have served their country, are the aims always uppermost in the mind of the psychiatric board.

IMPORTANT matters were discussed at a recent meeting of the Canadian National Committee for Mental Hygiene. Dr. John Amyot emphasized the need of dealing with the immigrant situation to prevent the entrance of mental defectives. The treasurer stated that private subscriptions for the year amounted to \$60,000, more than half of which had been given by a few Canadian ladies. The Dominion Government had voted \$10,000, which he hoped would become an annual vote. Complete and incomplete surveys had been made in schools in Toronto, Montreal, Ottawa, Guelph, Fort William and Port Arthur. Their field was limited only by their financial strength.

The executive and finance committees of the Association had accepted the request of Alberta and New Brunswick for a mental survey of these provinces. The adoption of a budget of \$45,000 followed. Resolutions for the spending of more time on the study of industrial psychology, and the employment of a worker in Halifax, to establish a mental clinic in that city, were passed.

SOME OBSERVATIONS ON THE OCCURRENCE OF ACIDOSIS AFTER ANÆSTHESIA

BY EDITH M. ROSS, M.D.

Formerly Resident Anæsthetist at the Winnipeg General Hospital

THE condition termed "acidosis", exclusive of the acidosis of diabetes, is one of fairly frequent occurrence in surgical practice, if one includes all cases in which there is an actual lessened alkaline reserve in the blood of the patient.

Restricting the use of the term to those cases which show actual clinical symptoms, this condition is fortunately much more rare; but these cases do occur often enough to make the condition one of concern to every practitioner.

We may recall briefly the clinical picture presented by these cases, which vary in severity from those showing rather prolonged nausea and vomiting, headache and slight restlessness, to those cases where the patient rouses from the anæsthetic only to lapse into a rapidly deepening coma, with rising temperature, pulse and respiration rates, and with death supervening within twenty-four or forty-eight hours.

Between these extremes, of course, lie the majority of those cases in which attention is attracted especially to this condition. In these cases the patients usually vomit excessively, and instead of diminishing the nausea and vomiting increase, the temperature and the pulse rate rise, the pulse often alarmingly; and a characteristic type of breathing appears. In this the nostrils are widely dilated, the mouth usually open, too, and the patient seems to be gasping for breath. It seems as though in spite of the fact that there is no obstruction the patient is not inhaling enough air for his needs, and, in effect, this is just what is happening. There is plenty of air getting into the lungs, but the blood has lost to a greater or less extent, its power of carrying oxygen, and the patient actually is "air-hungry".

Some four years ago, following what might almost be termed an epidemic of cases occurring for the most part among our out-patients tonsil cases, we began a routine examination of the urine

of all cases coming to operation and subsequently began to make an additional post-operative urinalysis, from all cases under one of the surgical services. This routine examination of anti-operative urine included tests for albumin, sugar, acetone and diacetic acid. We made no examinations of the blood of any of these patients, though we became convinced as our experiments proceeded, that an urinalysis would only be of value in those cases where elimination parallels formation of acid bodies; and we had no means of knowing whether this was the case in any of our patients. We came to this conclusion when we found that many patients excreted large amounts of acetone and diacetic acid in the urine, and had no symptoms, while we occasionally found patients in whom the toxæmia was fairly marked and who excreted little or no acetone or diacetic acid. And we came to believe that the patients who showed no symptoms except the presence of acid-bodies in the urine, did so because they were excreting practically all the acid bodies formed, and so did not encroach on their alkaline reserve, while in those cases where marked symptoms appeared, with no corresponding urinary findings, the patients were forming acid bodies in large amounts, and not excreting any.

We did not observe that the particular anæsthetic used made any difference in those cases giving positive results in the urinary tests, although we had no cases of pure chloroform anæsthesia in our series. It appeared that the nitrous oxide patients more seldom developed symptoms than others, but their urinalysis results were not appreciably different. We have no record of a case operated under local anæsthesia developing marked symptoms, though several vomited, and many gave positive urinary findings following operation.

We did not find that length of operation was a factor in the development of symptoms; on the contrary most of our severe cases were among children operated for removal of tonsils and adenoids, in whom the trauma of operation was comparatively slight, the amount of anæsthetic used small, and the length of anæsthesia, including the induction period, only about ten minutes.

We found about 22 per cent. of our patients with acetone and 15 per cent. with diacetic acid in the urine before operation. Caldwell and Cleveland of New York, in a very interesting article in the July, 1917, number of *Surgery, Gynecology and Obstetrics* state that 23 per cent. of their patients had acetone, while 13 per cent. had diacetic acid, these figures corresponding fairly closely with ours. But while they give figures of 72 per cent. and 56 per cent.

respectively for the acetone and diacetic acid tests in their post-operative examinations, our figures never showed more than 50 per cent. with acetone and about 35 per cent. with diacetic acid, and this only in the earlier period of our experiments. Later, following the adoption of more liberal feeding before operation, no purgation except an enema the morning of operation, and earlier and more plentiful feeding following operation, these figures were still further reduced.

Of these patients showing acetone and diacetic acid before operation, the large majority were patients who had been ill for some time, some with infections, many of them with the toxæmia of pregnancy, with pathological conditions causing varying degrees of starvation, or were children who had not been actually ill, but in whom one could trace the effects of too little food, or of some type of malnutrition. Some of the children were apparently healthy, but in these one could not overlook the element of starvation for the twelve or eighteen hours preceding operation.

On the other hand, practically all the emergency cases where the condition calling for operation involved the intestinal tract, with the exception of injuries, showed varying degrees of acidosis clinically, and almost invariable presence of acid bodies in the urine, and both the amount found and the severity of the symptoms appeared in these cases to increase with the length of time the patient had been ill before coming to operation. That is to say, those patients who came to operation within twelve hours of the onset of an attack of appendicitis usually showed no symptoms, and gave slight reactions in their urinalysis, while those patients who came in from two to three days or later, with abscess formation or peritonitis, usually displayed marked symptoms and gave more marked reactions. Whether this almost constant factor of acidosis in acute abdomens results from the presence of infection, as in appendicitis, or whether it results from the voluntary starvation of the patient and the vomiting of his illness, we were not able to determine; but we came to the conclusion that not only did the presence of these bodies in the urine not contraindicate operation, in acute conditions, but was an additional indication for it, since these cases usually rapidly improved following operation, in so far as urinary tests for acid bodies, and the clinical symptoms of acidosis, when present, were concerned.

It appeared that women more frequently developed acidosis than men, though this predominance was not marked. But it is certainly true that children were far more susceptible to this con-

dition than adults. So far as adults were concerned, the question of age did not seem to figure, since aged people did not develop it more frequently than those in the prime of life, unless one considers also among them the greater frequency of malignant conditions giving rise to starvation.

Children especially, but also adults, who exhibited great fear, appeared to develop symptoms of acidosis more often following operation, and this even when there had been no trace of acetone or diacetic acid in the urine beforehand. But it was not determined whether this fear was a factor in the subsequent development of acidosis, or whether the fear was simply one of the nervous manifestations of a pre-existing acidosis which was not shown in the excretions of the kidneys.

The mental factor in this condition is a very real one, and we have come to the conclusion that more attention given to the night's rest which the patient gets before operation and more attention paid to the type of induction of anæsthesia would repay us. Bromides are perhaps preferable to morphine, the night before operation, and it may be that it would be wise to make this routine treatment for all adults. A dose of morphine suitable to the individual patient, and combined with atropine, should be given from a half to one hour before operation. This and an induction slow and careful enough to eliminate the patient's sense of smothering and danger, and to prevent any actual deprivation of oxygen, and a tactful attempt to "humour him along" till consciousness has left him, certainly seem to us to be factors in the prevention of acidosis, and especially so in those very cases where one has most reason to fear its occurrence.

It has been our experience that the average patient showing acetone and diacetic acid in the urine before operation, but with no clinical symptoms can be safely operated, though they are to be closely watched and should be treated with soda and glucose in some form, as a routine. We have also found that when the acidosis depends upon the condition requiring operation, as a gastric ulcer, it is fairly safe to operate on such patients if there are no clinical symptoms; and if there are, to institute treatment, wait for a few days, and then operate, recommencing the treatment immediately. In the case of children coming for operations for which there is no special urgency, such as tonsillectomies, we have followed the practice of deferring operation, and feeding the child with sugars and carbohydrates in any form which he will take, also laying stress on large amounts of water, until the reactions are

negative and the child shows no clinical symptoms. One should repeat that this negative result of an urinalysis is only an approximate indication of the state of the patient's blood and when there is any doubt the blood should be examined.

We came to the conclusion that practically all these cases are simply a matter of feeding so far as treatment is concerned. For the prevention of symptoms of acidosis we believe that all cases coming to operation should be well-fed up till the morning of operation; that if operation is to be late in the morning they should have a light breakfast and should have water until within two hours of operation. This of course is not intended to apply to gastric surgery. Purgation is not advised; it has been found that an enema the morning of operation is usually sufficient. Bromides the night before, and a dose of morphine before operation are advisable, the latter because it does lessen the amount of anæsthetic required, to some extent, and because it makes the induction easier for the patient as a rule.

In adults we do not believe that there is necessity for active treatment with sodium bicarbonate as a routine, though any case which gives positive reactions in the urine, for acid bodies, or gives clinical symptoms, should at once be put on treatment.

Following operation the patient is to be encouraged to drink quantities of water as soon as conscious and to eat good as soon as possible. He will probably vomit what he drinks and what he eats, at first, but he will recover from his post-anæsthetic nausea all the sooner for that. The diet should be increased to normal as rapidly as possible. If acetone appears in the urine and especially so if clinical symptoms appear, sodium bicarbonate in large doses, and glucose should be given, and if the condition is at all alarming these may be given intravenously. Three of our cases where the vomiting was most distressing and persistent ceased vomiting almost magically following intravenous injections of a solution of soda. In all these cases the urine showed both acetone and diacetic acid, which rapidly disappeared following the injection. No blood tests were made in any of these three.

In children on the other hand, we feel that it may be the part of wisdom to give all of them preventive treatment. That is to say, all children coming to operation should be over-fed for some days at home before coming to the hospital, they should have a full meal the night before operation, and should have rich gruel with sugar early in the morning of the operation; or if the operation is not to occur till late in the forenoon should have breakfast. They

should not be given milk on the day of operation, since it is apt to form curds and give trouble when the child vomits. Broth, gruel, plenty of water, and besides this, as a routine measure, a capsule, containing five grains each of sodium bicarbonate and glucose, before operation. This may be followed after operation by further active treatment, along the same lines if it appears necessary, but it is believed that if this procedure were carried out before operation, post-operative treatment for acidosis would only rarely be necessary in children.

We wish to acknowledge the assistance and encouragement of the staff surgeons of the hospital in what work we have done along these lines.

THE Medical Faculty of McGill University have recently passed the following resolution:

"That the Faculty of Medicine of McGill University has received with the greatest appreciation information from Mr. J. D. Rockefeller of his donation of five million dollars for the cause of medical education in Canada. . . . Be it resolved, at the first opportunity, therefore, that this faculty, records its gratitude to Mr. John D. Rockefeller for his great benefaction, and further the assurance that, in so far as lies in their power, every effort will be made to co-operate with other institutions to attain such results as would satisfy the expectations of the Foundation."

PROLONGATION OF LIFE

BY ADAM H. WRIGHT, B.A., M.D.

Toronto

TWO prominent Canadians died a few weeks ago, and our Dominion lost thereby citizens of great value, who under ordinary circumstances should have lived and worked twenty years longer. They were Honourable Mr. Hanna and Mr. W. P. Gundy; their ages, fifty-seven and fifty-nine respectively; both at the age of fifty-five being unusually healthy and vigorous. In each case, death was due to over-work undertaken from patriotic motives, the one as Food Controller, the other as a member of the Munition Board. These were preventable deaths.

We have in Toronto many persons to-day, strong, healthy and active, who are more than twenty years older than these two men. Let us name three: Colonel George T. Denison, our wonderfully efficient police magistrate, aged eighty; Honourable Feathertson Osler, who retired from the Court of Appeal when seventy-two years of age to take the very responsible position of president of the Toronto General Trusts Corporation, now aged eighty-one; Mr. John Catto, one of our most active and energetic business men, aged eighty-six. So far as we can judge at present, it appears likely that these three men will continue to perform strenuous work for more than ten years to come. Many of us know that Sir Mackenzie Bowell appeared to be as strong physically and mentally at ninety as he was at sixty.

Many live for ninety years; a few live one hundred. A man of ordinary health and vigour at fifty should live to be ninety to a hundred.

We are apt to think in a general way that a delicate youth of twenty will not live to old age. A certain young man, named Hagarty, of Toronto, wished to obtain a policy for life assurance about 1830, but was rejected by the medical examiner of the Canada Life Company. The young man finished his course in law, practised his

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profession, and in time was elevated to the bench. During his life, every man, woman and child, including the chief, the office men, choremen, messengers, charwomen, etc., connected with the Canada Life died. He survived them all, and finally died as Sir John Hagarty, Chief Justice of Ontario, aged eighty-three.

While there is no doubt that life in the open tends to produce longevity, it has been found that a large proportion of our athletes do not live to old age. Excess in physical exercise is frequently as harmful as excess in working, eating or drinking.

Some think it is not desirable to live to an age accompanied by physical and mental weakness, or to silly doting old age. We wish for nothing of that sort, we want to prolong mental and physical energy with some enjoyment and usefulness, and without bodily suffering. The mental faculties are sometimes slightly impaired at the age of eighty or ninety, as compared with those of fifty or sixty; but in healthy old age, which we should always strive for, we seldom find imbecility, or a lately acquired ill-tempered disposition.

How are we going to enable people to grow old happily and gracefully? *Judge* tells us of a philosopher who remarked: "I often wonder about Methuselah. He lived to a ripe old age. Yes; but I could never learn that he made any statement as to what he attributed his ripe old age."

Perhaps we might get a lesson from Van Dykes' venerable "Dr. Coffin", whose face was like a monument, and whose practice rested upon the two pillars of podophyllin and predestination. He probably looked solemn, purified the liver with his podophyllin, and convinced his patients that old age was foreordained for them.

In a short paper one can only make a brief reference to the hygienic treatment of advancing age. We may learn much from those who are growing, or have grown old. Mr. Chauncey Depew is one of the best known and most remarkable men in the United States. He completed his eighty-fifth year a short time ago, is strong bodily and mentally, full of cheerfulness, and now keenly interested in the "passing show" of the world's greatest crisis. He has been for more than a generation the brightest after-dinner speaker in North America. He was, for many years, a heavy smoker—twenty cigars a day; stopped twenty-five years ago because of insomnia, indigestion and nervousness. He realized the danger of constant drinking and limited himself to one pint of champagne each evening after dinner, and at no other time. He avoids worry and eats sparingly. On the advice of an English physician he gave up beef

thirty years ago, and has taken none since. Has never taken exercise; goes to his office every day; works forty-four hours a week and enjoys it.

Perhaps Sir Hermann Weber, the able English writer on longevity, might consider that Mr. Depew has led an "injudicious life". His habits would scarcely be termed orthodox by hygienic authorities, but his heterodoxy is interesting, and worthy of some study.

He takes a keen interest in events. He says: "every day brings me a thrill now." "This period gives me an appetite for living." He cultivates a cheerful disposition, and an even temper. Dr. Williams, of Harley Street, London, England, thinks that matters of dress influence our tempers to a large extent. He speaks as follows about our neckgear: "Man, in clinging to the high collar which George IV made fashionable because he had a wart on his neck, is sinking lower and lower into irritability and headaches."

Mr. Depew, although almost a professional "diner out", is a small eater. This brings to our mind the case of the Italian nobleman, L. Cornaro, who died in 1556 at the age of a hundred. He had been an invalid up to his fortieth year, and then, by rigid restriction of his diet, he recovered his health and vigour, which he preserved to an extreme old age.

Mr. Depew stopped smoking. Perhaps if he had simply cut down the number of cigars from twenty to two, he would have found the results satisfactory, as we think that the moderate use of tobacco is not injurious as a rule. He cut down his alcoholic beverages many years ago, and made one pint of champagne per day the limit for many years. While this seemed to suit him, we are inclined to think that it is due to an idiosyncrasy, peculiar and interesting, perhaps, but very rare.

This brings up a question of interest, but too extensive and complicated for discussion in this paper. I desire, however, to express my personal opinion that in a large proportion of cases a certain amount of alcohol, especially as found in Canadian rye whiskey, is beneficial for the aged.

All will agree that worry is harmful, but often difficult or impossible to avoid. The physician can, however, in many, if not in all cases, prevent some of the "worry over things that never happened".

Mr. Depew works forty-four hours a week and enjoys it. We may consider three things together—work, rest and sleep. This brings to my mind the late Sir George Ross, for some time premier

of Ontario. For fifty years at least, I believe he accomplished more work per year than any other man I have known. For a long time he did not spare himself in any way, but during his last fifteen years, from about sixty to seventy-five, he was careful and methodical in his habits. He worked about eight hours (sixty minutes to the hour), spent eight and a half hours in bed, about three-quarters of an hour on a sofa each afternoon, the remaining hours in rest and recreation, the latter limited in variety because he was seriously invalided from chronic rheumatism for over twenty years. He divided his working hours into periods of about two hours each, and gave his brain a brief rest between periods. Although suffering much at times, he was bright and cheerful through it all.

The report says Mr. Depew has never taken exercise. What that means is not explained. It may be that he never played baseball, football, cricket, or marbles; but a busy man such as he can scarcely go to his office, attend meetings, go out to luncheon, dinner, attend functions of various sorts without some exercise. It may be walking, but that is the best kind of exercise an aged man can take.

It would not be fitting to close even an incomplete paper like this without referring to the vast importance of regular and efficient action of the bowels. If this can be brought about with or without recourse to cathartic medicines, it will do much to keep smooth the path to old age.

In conclusion, let me say that we should put forth all our efforts to prolong the lives of such men as Honourable Mr. Hanna and Mr. H. P. Gundy. But you may say; strong minded men are, frequently, or generally, obstinate and hard to manage; and you may ask: can we do much for them? Yes, we can; such men are amenable to reason when things are properly explained.

In speaking or writing briefly upon such an extensive and complicated subject as the treatment of advancing age, one can only refer to certain features. Various questions arise, each of which is so vast and so important that volumes might be written thereon.

In referring to overwork as a cause of death in certain cases, I do not mean to say that these men died directly of exhaustion from too much work. I have called attention to Sir George Ross to show that a man can do an enormous amount of work, even after the age of seventy, and at the same time take much enjoyment out of life, even though he was suffering more or less from bodily pain. In a social way it was always a pleasure to meet him, as he was ever bright, cheerful and entertaining. But bear in mind, in his case,

that he carried out a certain system of living, which included work, rest, sleep and recreation, together with definite rules as to diet and the care of the secreting and excreting organs, under the guidance (I may say) of a very wise physician, Dr. Robert Stevenson.

We cannot lay down a set of rules with mathematical precision' but the general practitioner can do much in the way of assisting his patients in their advancing years. But to do this he should study each case carefully in all its aspects, and endeavour to correct faulty conditions which, if untreated, will end in organic disease.

THE municipal hospital scheme, so far as Canada is concerned, had its origin in Saskatchewan. The act in that province came into force in 1916. The following year Alberta passed a similar act, and at a session of the legislature, Manitoba followed suit later. The operation of the act in all three provinces is the same. Any movement for a hospital must come from the constituents themselves. The propaganda work is usually begun by some organization or group of individuals interested in the project. The councils in any given district must pass resolutions agreeing to submit the hospital by-law to the ratepayers, generally speaking, at the time of the regular municipal elections. Should this be endorsed, representatives to the hospital board are appointed who will have the building and management of the hospital in their keeping. In Alberta the hospital board has been made elective by session of the legislature. Two or more municipalities, or parts of various municipalities, may co-operate for the erection and maintenance of a hospital. The acts provide that a levy may be made on the municipality to take care of the building, operating and other expenses.

Case Reports

IS THERE A PLACE FOR SPINAL ANALGESIA?

BY GEORGE E. ARMSTRONG, M.D.

Surgeon-in-Chief, Royal Victoria Hospital, Montreal

IT is noteworthy that during a visit to the surgical clinics of Great Britain and the Continent, one sees comparatively few operations done under spinal analgesia, and on this side of the Atlantic it is not often used. Indeed, at the meeting of the American Surgical Association in Denver, some years ago, the statement that spinal analgesia had no place in a modern operating room, was not challenged.

Spinal analgesia has, however, had some warm advocates, notably, Tuffier of Paris, and Barker of London. In 1907, Barker published a report on a series of cases on which he had operated under spinal analgesia, and gave a full account of a new factor which he embodied in his technic. This was the force of gravity, acting on an analgesic solution of greater density than the spinal fluid, by which the height to which an injected solution extended in the spinal canal could be controlled and its effects localized to certain regions of the spinal cord.

Various agents have been used, but recently tropococaine has become the favourite. A 5 per cent. solution has a specific gravity of 1.0106 which is considerably higher than cerebro-spinal fluid, 1.007.

During the war, statistics were published showing that spinal analgesia was more dangerous than ether. I am sorry that, at the moment, I cannot lay my hands on the article.

Nevertheless there occur, now and then, conditions imperatively demanding operative treatment, in which the patients are not good subjects for general anaesthesia. In some such cases, spinal analgesia offers certain advantages and may be given with satisfactory results. In illustration of this statement I report briefly three cases.

A young woman, thirty-two years of age, was admitted to Dr. W. F. Hamilton's service in the Royal Victoria Hospital, Mont-

treat in February, 1920, and later transferred to the surgical ward suffering from gangrene of the left foot.

She had suffered from headache since the first month of pregnancy. Her feet began to swell in October, 1919, and she was sent to the Maternity Hospital in December. She was then seven months pregnant and was then described as suffering from a cardio-renal condition with failing compensation, endocarditis, mitral stenosis and regurgitation. Labour was induced on December 16th, and the patient delivered of a seven months' child. Her condition immediately after delivery was satisfactory. Three days later she complained of severe abdominal pain with distension and a diagnosis of embolus was made. The symptoms subsided under treatment. Pain in the left foot was complained of on December 23rd, and was followed by discolouration. The diagnosis of embolus seemed justified. Her family history was unimportant. She gave a history of rheumatic fever at nine years of age, also diphtheria. Pleurisy in 1913. She had been pregnant nine times; two full-time children, one premature and six miscarriages (between second and seventh month).

As at that date there was present not only the chronic parenchymatous nephritis, but also general oedema, ascites and hydrothorax, she was referred back to the medical side for further treatment.

On readmission to the surgical department three weeks later, the conditions were somewhat ameliorated, but she was in a very poor condition for a major operation. The gangrene had extended along the dorsum of the foot, but a line of demarcation was present and amputation was indicated.

Under spinal analgesia (5 per cent. tropococaine), a Symes' amputation was done. She suffered no pain, there were no untoward symptoms during or after operation. Healing took place *per primam*, and there was steady improvement in her general condition. Pathological report: Thrombosis.

Case 2. Mrs. L., age fifty-three. Gangrene of the right foot. Five weeks before admission to the Royal Victoria Hospital, she was awakened in the night by a sharp pain in her right foot. The pain was relieved by rubbing and the application of hot towels. The next day she could walk about the house without pain. There was no swelling of the foot or leg. A week later she was again awakened in the night by a similar but sharper pain in the same leg. Rubbing and hot fomentations did not afford any relief. Her physician found it necessary to administer morphia and a little

chloroform before relief from the pain was obtained. She had more or less pain in the leg from that time until her admission to the hospital. Fomentations had been used freely and morphia at bed time to secure rest and sleep. Three days subsequent to the second attack, discolouration was noticed over the toes and dorsum of the foot. A sensation of pins and needles was present and the foot became cold. On admission a dry gangrene extended up to the middle of the leg.

Family history negative. There was a history of an attack of acute rheumatism with neuritis and pneumonia at the age of forty-one years.

On examination, signs of the existence of both mitral and aortic regurgitation were present with auricular fibrillation of a moderate degree; also a chronic nephritis.

The gangrene was regarded as embolic in origin. Amputation of the foot was indicated. On account of the cardiac and renal condition, spinal analgesia was thought to be safer than a general anæsthetic.

A 5 per cent. solution of tropococaine was employed. The patient did not suffer during the operation, nor were there any unpleasant symptoms afterwards.

The cardiac condition has perhaps improved, but she still suffers from pain in the left knee and in the joints of the fingers and elbows.

Case 3. J. P., age seventy-six. Gangrene of the left great toe. The toe had become somewhat painful nine weeks before his admission to the Royal Victoria Hospital on February 15th, 1920. One month before admission the toe had become discoloured. He stated that his foot had hurt him. Family history negative. The patient gave the history of an attack of acute rheumatic fever at the age of sixteen years and an attack of typhoid fever at twenty-eight years of age.

Physical examination revealed the signs of mitral stenosis and regurgitation, aortic regurgitation and a chronic interstitial nephritis.

Amputation was performed above the knee, under spinal analgesia, using a 5 per cent. solution of tropococaine. There was no pain during operation and no untoward symptoms afterwards.

In one other condition I believe that spinal analgesia is indicated. We are, occasionally, fortunately not often, called upon to deal with severe crushing injury of the lower extremities, perhaps

a thigh. The injuries are the result of very great violence, as for example, a railroad accident.

The man is in a condition of severe shock. An anæsthetic is contraindicated. Under spinal analgesia the tourniquet may be removed, the infected and devitalized tissues removed, hæmorrhage controlled, and, if necessary, amputation performed without increase of shock. Days of anxiety are removed. I refer to the hours the surgeon spends, often in association with one or more colleagues, trying to decide which course is fraught with the less danger: amputations and the shock likely to follow, or waiting with its danger of spreading infection and toxæmia.

THE formation of the Ontario Neuro-Psychiatric Association has just been decided. Its object will be to promote a greater interest in nervous and mental cases. Its work is designed to be more widespread, however, and will extend to the study of defective children, to social welfare work, to the question of greater care in the selection of emigrants, the many and varied problems relating to the feeble-minded, to psychoses and neuro-psychoses.

The following officers have been elected: President, Dr. E. Ryan, Kingston; vice-president, Dr. H. Clare, Toronto; secretary-treasurer, Dr. C. Crawford, Whitby; executive committee, Dr. W. M. English, Hamilton, Dr. Goldwin Howland, Toronto; Dr. Beemer, Mimico; Dr. R. H. Armour, Toronto; Dr. C. K. Clarke, Toronto.

CASE REPORTS FROM THE MONTREAL GENERAL
HOSPITALTORSION OF THE LEFT TESTICLE FOLLOWED BY
GANGRENE OF THE TESTICLE AND EPIDIDYMIS

MR. ———, age twenty-one years, M. G. H. No. 1828, 1919, was admitted, complaining of pain and swelling of the left half of the scrotum and the left testicle.

Personal history. Denies venereal disease; has always been well.

Family history. No tuberculosis.

Present illness. The left testicle became painful soon after strenuous exercise in a gymnasium. This was soon followed by swelling of this organ and oedema of the scrotum. The pain became so acute that he went to bed and it was not relieved by the continuous application of an ice bag. He was admitted to the hospital one week after the onset of symptoms.

Examination. A well-nourished young man. Does not appear very ill. Temperature, 100°, pulse 90, respiration 20. All the systems except the genito-urinary are negative. The left half of the scrotum is greatly swollen and oedematous. The left testicle, left epididymis and left spermatic cord are also swollen and very tender. The normal anatomical relation of the testicle and epididymis cannot be made out on account of the swelling and tenderness. The lower aspect of the left testicle is adherent to the scrotum. There is no urethral discharge. The prostate and seminal vessels are normal on palpation and there are no pus cells or bacteria in the prostatic smear. The urine was normal and the Wassermann negative.

Diagnosis. Acute epididymitis of unknown origin.

Treatment. On account of the great swelling and tenderness which had become worse under treatment an epididymectomy was recommended.

Operation. A free incision was made in the scrotum. The epididymis was found to be gangrenous. Further examination showed that there was no pulsation in the vessels of the spermatic cord, and that the testicle was gangrenous and turned inward upon itself for almost one and one half turns.

It was then realized that we were dealing with torsion of the testicle which had interfered with its normal blood supply and led to gangrene of this organ and its epididymis. Castration was done. The wound healed by primary union and the patient left the hospital well, and has continued so.

Summary and Remarks. After violent gymnastic exercise, acute pain and swelling within the scrotum simulating acute epididymitis. At operation there was found torsion of the left testicle with strangulation of the vessels of the spermatic cord which had led to gangrene of the testicle and epididymis. Castration was done. Recovery.

The condition is rare and difficult to diagnose after swelling has developed. A diagnosis may be made early by a careful examination of the anatomical relations of the testicle, epididymis and spermatic cord. If the condition is recognized early reduction of the torsion may be possible.

In the case reported above, it is probable that the torsion was due to the violent gymnastic exercise which immediately preceded onset of pain in the testicle.

R. E. POWELL,

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GANGRENE OF THE CÆCUM AND COLON IN A CASE OF ACUTE DYSENTERY

R. S., age thirty-six years, M. H. G. 1232-1920, was admitted to the hospital, March 14th, 1920, complaining of general malaise, vomiting, anorexia, and constipation. The family history was not obtainable.

Personal history. The patient, a French-Canadian, had lived all his life in the Province of Quebec, and for some time past in Vaudreuil County. He has always been well.

Present illness. (Obtained from his friends as he was too stuporous to give an intelligent history.) He was well until March 6th, eight days before admission, when he began to complain of pain in the abdomen, general malaise, anorexia, and vomiting. Vomiting soon became severe and persistent, but it has never been projectile or faecal. The vomitus consisted of undigested food and

bile stained mucus. The abdominal pain was generalized at first but gradually became localized to the lower right quadrant. The pain was never severe and disappeared two days previous to admission to the hospital. The bowels moved naturally on the 6th and with an enema on the 10th, 12th and 14th of March. No blood or mucus was noted, but special attention was not paid to the nature of the stools.

Condition on admission. The patient walked into the hospital. He looks very ill and is in a stuporous condition. He vomited bile stained fluid just after admission. The face is flushed and somewhat cyanosed; eyes dull. He is hiccoughing constantly. The skin is cold and clammy. Temperature 96.6° per rectum, pulse 88, regular, of small volume and low tension. Heart sounds very feeble. Respiration shallow, rate 20 per minute. Teeth poor, tongue heavily coated, breath very foul. Throat and lungs negative. The abdomen is slightly distended and does not move freely on respiration. There is no abdominal rigidity, but there is slight resistance in the right lower quadrant. On deep palpation there is some tenderness and a feeling of slight fulness in the region of the cæcum. No mass is felt. There is slight dullness in the right flank. Rectal examination is negative. There are 42,000 white blood cells to cubic millimetre.

A diagnosis of acute peritonitis of unknown origin was made and immediate operation was advised. A grave prognosis was given.

Operation. General anæsthesia. On opening the abdomen the odour of *B. Coli* pus was noted. There was no free fluid in the abdomen and no adhesions between the viscera. Beginning at a point about one and one half inches below the vermiform appendix and extending downward along the anterior longitudinal muscular band of the colon there is a wide irregularly shaped area of gangrene four inches long, in the wall of the cæcum and colon. The intervening intestinal wall shows marked congestion of its blood vessels and a slight fibrinous exudate upon its peritoneal surface, but there is no necrosis.

A diagnosis of gangrene of a portion of the cæcum and ascending colon, secondary to acute dysentery was made. The incision was enlarged, and the ileum cut across about one inch proximal to the ileo-cæcal valve with the intention of excising the gangrenous area and performing a lateral anastomosis between the ileum and the transverse colon. Unfortunately, the patient died before the operation could be completed.

The mucous membrane of the cæcum and about half of the ascending colon showed a very intense acute inflammatory reaction of the character of that seen in bacillary dysentery, as well as areas of necrosis in the wall of the cæcum and colon.

Summary and Remarks. Male, never out of Canada. Ill eight days. Admitted with signs of acute peritonitis. Vermiform appendix normal. At operation there was found gangrene of the large bowel which was considered to be of dysenteric origin. Confirmed by post mortem.

Gangrene of the cæcum in dysentery is occasionally seen in tropical and sub-tropical countries, but it is most unusual in this part of Canada. A very unusual feature of this case was the complete absence of diarrhoea. In a case under my care in Salonika I drained the ileum with a Paul's tube. The patient died of toxæmia.

The differential diagnosis between gangrene of the cæcum and other severe acute inflammatory lesions in this location can scarcely be made with certainty, but it should be considered in cases of dysentery where there develops signs and symptoms of severe acute inflammation in the right lower quadrant of the abdomen.

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INFLUENZA COMPLICATED BY INCARCERATED FIBROID UTERUS AND MISSED CERVICAL ABORTION

MRS. C., age thirty-four years, M. G. H. 1309-1920, was admitted on February 18th, 1920, with influenza. While in the hospital, free uterine bleeding occurred. She had been married two years, had menstruated last, December 8th, 1919, and had had vomiting and other signs of early pregnancy. On vaginal examination the internal os was closed, the cervix uteri lay in the vaginal axis, and was forced up under the symphysis pubis by an indefinite mass which filled the pelvis. In its lower portion this mass was rather soft and boggy.

On examination under light anæsthesia the condition was

found to be an incarceration of the uterus, which when freed, gave the impression of a double tumour—a large and firmer body, which was thought to be the uterus, and behind and to the right of it a softer mass, which was considered to be, possibly, an extra uterine pregnancy.

On this assumption she was operated upon. When the abdomen was opened an enlarged uterus presented, the enlargement being due to a fibroid about 5 cms. in diameter, situated in the anterior and upper portion of the fundus. The boggy mass which had been felt on vaginal examination was situated on the right side beneath the broad ligament. Its nature was not determined until, after preparation, the left hand was introduced into the vagina and one finger pushed up into the cervix from below. Then, aided by pressure from above, a missed abortion of about six weeks was squeezed out into the vagina. The fibroid was removed in the usual way and the wound closed.

Convalescence from the operation was slightly complicated by the return of a chronic asthma. She was returned to the medical service on the sixteenth day after operation in excellent condition.

Summary. Uterine hæmorrhage during influenza. A diagnosis of incarcerated uterus with fibroid and possibly an extra-uterine pregnancy was made. At operation the fibroid was removed and what was considered to be, possibly, an extra-uterine pregnancy was found to be a missed cervical abortion.

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Editorial

ADVANCED TRAINING FOR NURSES

THE Canadian nurse has made her way, by sheer force of ability and suitability, to the very forefront of her calling in two hemispheres, and, other things being equal, she need not fear competition with her sister of any nationality, and for that very reason it is due to her that her facilities for training, and her opportunities for preparation, shall be of such a nature as shall not diminish the advantage which her personal qualities have given her.

Her training has two phases. There is the actual hospital routine in which she is brought up, and there is the leadership in the training school which directs her technical education. The former is the product of the medical men and the students and the traditions of the institution in which her years of training are spent.

The maintenance and improvement of this environment is essentially a medical question and need not be further considered here, but the second feature, the leadership of the training schools, is a nursing problem which not only concerns nurses but medical men and hospital boards as well. Leadership not only demands a personality, but a training, and training for advanced workers in nursing, such as superintendents, assistants, nursing teachers and directors of special departments such as dietetics or public health, is not at present readily available in Canada, and when Canadian nurses go outside of Canada to get such a training, they are frequently absorbed by the country into which they go, and are lost to Canadian institutions.

This fact presents one good reason for the establishment

of such a training in Canadian centres; and another reason is the elevation of the general standing of nursing practice which the proximity of such an advanced training course would inspire. It would seem expedient that such a course should be conducted under the direction of a university, perhaps best associated with its department of education, and carry with its consummation a university degree.

The suggestion that it should become a sub-department of the medical faculty has a number of objections against it. Although some of the subjects, such as anatomy and chemistry and physiology would be included in the course, they would not be taken up in the same way as for medical students, and other subjects such as psychology, principles of education and domestic science would not be available in the medical curriculum.

But while the course could be controlled by a department other than the medical faculty, courses in medical subjects such as public health, bacteriology and chemistry could be given by members of the medical teaching staff. The same arrangement could be made with other university departments such as the social service, physical education and psychology departments, and there should be no difficulty in having the co-operation of hospitals connected with the university for the purpose of practical demonstrations.

A number of questions will arise as to the nature and length of such a course.

It should be conceded that at least a university matriculation, if not two academic years, should be required as a preliminary, and a period of one or perhaps two years' study in addition to the regular nursing course should be required for a certificate. The suggestion that such a course should run parallel but not identical with the regular nursing course has some objections. To properly qualify as a superintendent or director, it would seem desirable that the candidate should have personally done the work which she will eventually oversee, and again the personal fitness of the candidate

for a position of responsibility in an institution may be more readily appraised during her pupil period. If such qualities do not then appear, but if, on the contrary, fitness for actual nursing is more apparent, a good nurse is not lost in a poor superintendent.

Having the preliminary education and the regular hospital course in training, the young woman is prepared to enter the post graduate course. This will involve, of course, the expenditure of a year or two of time, and of considerable money, which may prevent some of the most capable candidates from undertaking the additional course when they have already a training which is an immediate source of income. Here lies a matter which hospital boards might readily look into. One or more scholarships to pay in part, or in whole, the expenses of prospective members of the administrative staff would be a most profitable investment, if at the same time suitable candidates were kept under observation.

To the University of British Columbia, we believe, goes the credit for initiating such an advanced nursing course in Canada, and it cannot be long before other schools must follow their lead.

Retrospect

SURGERY OF THE PERIPHERAL NERVES

BY FREDERICK J. TEES, M.D.

Surgeon to Out-Patient Department, Montreal General Hospital

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- FRAZIER and SILBERT: "Observations in Five Hundred Cases of Injuries of the Peripheral Nerves." *Surg., Gyn. and Obst.*, vol. xxx, No. 1, January, 1920, p. 50.
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- DELAGENIERE: "Surgery of Wounded Nerves." *Jour. A. M. A.*, vol. lxx., No. 22, June, 1918, p. 1620.
- JOYCE: "Study of a Series of Peripheral Nerve Injuries from a Surgical Standpoint." *Brit. Jour. of Surg.*, vol. vi., No. 23, January, 1919, p. 418.
- THOMAS: "Nerve Injuries." *War Medicine*, vol. ii., No. 7, February-March, 1919, p. 1351.
- PLATT: "Results of Bridging Gaps in Injured Nerve Trunks." *Brit. Jour. of Surg.*, vol. vii, No. 27, January, 1920, p. 384.

THE statement can probably be made without challenge, that no chapter of surgery has aroused greater interest in the past five years—to judge by the mass of literature that has appeared—than that dealing with injuries of the peripheral nerves.

Pre-war text-books devoted pages to the description of oper-

Read at McGill Reporting Society, Montreal, March 9th, 1920.

ative methods, based on observations necessarily limited, upon which the accumulating evidence of the war results has been brought to bear. The final chapter is not yet written: another two years at least must pass before the reports appear which commissions in the various belligerent countries are preparing, and we must await their final summing up. But we have even now a wealth of material from which to form conclusions, and there is coming to be in the main a striking unanimity of view among those best qualified to judge.

The majority of nerve wounds do not call for operative interference. Tinel believes that 60 to 70 per cent. of nerves which show initial evidence of injury are but slightly damaged and are capable of spontaneous regeneration. It is in the cases which fail to show this improvement that the problem arises as to when operation should be undertaken.

Tinel's view is that the diagnosis of a complete interruption does not necessarily mean intervention. One must have evidence of the absence of regeneration, or of defective regeneration—a certainty that regeneration is not taking place or is progressing badly. It is scarcely possible to establish this certainty in less than from two to four months after wounding. He argues from successes met with after a year that early intervention is not indispensable, but expresses the view that early suture is followed by more rapid regeneration. Alexander, on the contrary, working at Alder Hey (quoted by Frazier) maintains that cases sutured within four months of the injury do not do as well as those sutured after the sixth month, probably because degeneration is not complete in the peripheral segment.

While operation must necessarily be delayed by the presence of sepsis, and postponed because of suppurating wounds, and stiffness of joints, necessitating the treatment of infection and the freeing and developing of the muscles, Sir Robert Jones, whose experience has been so wide, advocates exploring with the least possible delay, not because the chances of regeneration of the nerve are lessened, but because of the impairment of muscle power by a chronic myositis. A contused or compressed nerve will early show signs of recovery. In cases which do not spontaneously recover in a month or two it is usually a mistake to await regeneration of the nerve, and an exploratory operation should be undertaken.

Sir Harold Styles writing on this point says, "Increased experience has convinced me that we often delay too long in operating.

We are justified in delaying if there is definite evidence that improvement is taking place, and this is more likely to happen if the nerve has been contused as a result of a fracture or if the symptoms are due to the pressure of callus. In such cases the improvement is progressive and often ends in complete recovery. In cases, however, where the nerve has been directly injured by a bullet or a piece of shrapnel, it is, I think, a mistake to wait, although the lesion may be only partial. Many of these partial lesions are attended with severe pain, with aggravated trophic disturbances and with cicatricial or reflex contractures. In such cases valuable time is wasted in waiting for a recovery, which in the end is only very partial. If the wound has been healed for a few weeks there is little fear of trouble arising from the lighting up of latent mischief. The operation can do no harm, the wound is healed in a fortnight, and the exploration enables us to ascertain the exact nature of the lesion. The pain, the trophic changes, the reflex spasm, and the contractures often rapidly disappear. In short the operation will not only expedite the recovery but will at the same time render it more nearly complete."

Frazier analyzing results to date in the American army, advocates waiting for three months after the healing of the wound. This usually comes to mean six months after wounding, and allows ample time for spontaneous recovery, if it is to occur. "If at this time there are no signs of spontaneous recovery, on the one hand, and there is substantial evidence of a complete nerve interruption, whether or not this is interpreted as an anatomical division or a central neuroma, there are no grounds for further delay. One must not be deceived by the action of supplemental muscles which may compensate for the paralyzed muscles, as in one instance I recall when the war surgeon reported to me six months after the injury that a patient with a complete median and ulnar paralysis could flex the wrist, and asked to have the operation postponed. An examination revealed the fact that the patient had learned how to flex the wrist with the short extensors of the thumb."

Frazier emphasises the fact that it is impossible to distinguish with certainty by any single sign or syndrome whether we are dealing with complete and transitory block or a complete anatomical division, though in the majority of cases a careful examination of the motor, sensory, and electrical disturbance foretells the character of the lesion. Thus in a series of explored cases the following were the findings:

	Complete Motor Paralysis	Complete Sensory Paralysis	Complete Reaction of Degeneration
Compression.....	45 per cent.	15 per cent.	0 per cent.
Neuroma in continuity.....	74 per cent.	33 per cent.	16.5 per cent.
Complete anatomical interruption.	100 per cent.	86 per cent.	85 per cent.

Benisty working in La Salpêtrière under Pierre Marie, drawing inferences from a series of 150 operative cases, comes to these conclusions: "We are able to state definitely that an exploratory incision in nerve wounds is quite harmless when the surgeon is sure of his technique, conducts the operation with prudence and despatch and insures absolute asepsis. When clinical examination reveals persistence of the *signs of a severe lesion*, the fourth month should not be allowed to elapse before interfering."

METHODS OF OPERATION

As to the actual conduct of the operation, few will disagree with Styles in his emphasis on the following practical points; a thorough knowledge of anatomy on the part of the operator, who will conserve branches by knowing where to expect them; clean decisive cutting with a sharp knife; ample assistance. He advises against the use of a tourniquet, no doubt wisely, as the tendency to subsequent oozing is thereby lessened, and the vessels serve as a good guide to the nerve and its branches. Most operators advise approach to the nerve through normal tissue above and below the lesion excising the scar tissue. All unnecessary trauma to the nerve is avoided. When the nerve sheath is found intact and a response to weak faradism is obtained, close the wound without interference (Jones). Neurolysis or freeing is permissible when it restores a mobile, free and supple nerve with no obstruction in the centre (Tinel). This is indicated in compression, even if severe and extensive (Delageniere), gives excellent results in simple cases of constriction by a fibrous band, in evident pressure from callus, from a bone spicule, or from aneurism (Frazier). Do a neurolysis if the nerve responds promptly to faradic current (Frazier); an exsection if faradic response is feeble (Styles). Neurolysis is ineffective in severe lesions, in cicatricial nerve keloid and in exuberant neuromata (Tinel, Delageniere).

Frazier admits the difficulty of deciding between liberation and resection in certain cases of sclerosis or fibrosis of the nerve. He advocates a resection of spindle-shaped neuroma if after sufficient time has elapsed, arbitrarily given as six months, no response is obtained to faradism. With this Joyce disagrees, who advises a neurolysis capsulectomy first, with resection later if this fails.

Delageniere is not on the whole enthusiastic about neurolysis. From a series of 113 of these operations it has seemed to him that the procedure does not on the whole yield results superior to non-intervention. If in doubt Styles favours exsection, provided end-to-end approximation can be secured, and Tinel's much quoted dictum that "a good suture is better than a bad liberation" puts the truth in a nutshell.

As to the benefits of resection and suture when end-to-end approximation can be obtained there is no doubt. End-to-end suture is the method of choice when there is complete interruption with no regeneration: to quote Tinel, "It is the only way." The older methods advocated of turning down flaps find no favour. The prime requisite is the presence of healthy fasciculi free from the grasp of connective tissue. Slice after slice of the divided ends are removed until this is obtained. As to the actual technique of suture the advice given in a twenty year old edition of Rose and Carless holds good to-day. Suture is "best accomplished by using a domestic sewing needle without cutting edges . . . and the finest chromicized catgut. One or more stitches should pass through the nerve and the rest merely through the sheath. Absolute asepsis is essential in order to obtain satisfactory results." While a few operators prefer silk or linen, catgut undoubtedly holds pre-eminence to-day. Care must be exercised to avoid torsion, and crushing of the ends one upon the other must be guarded against.

In many cases it is surprising how end-to-end approximation can be obtained even where the removal of considerable length of nerve is required, by such devices as altering the position of joints; stretching of the nerves (this while the bulbs are still attached to lessen trauma to the freshly cut ends); transposition of the nerve and free exposure. Styles, for instance, does not hesitate to expose the ulnar nerve from the shoulder to the wrist in order to effect end-to-end suture.

A most useful method which developed during the later years of the war is the two-stage suture, as for instance in the case of a median injury near the elbow, in which the uncut bulbs are sutured

together with the forearm in flexion. By gradual extension of the elbow the nerve is stretched, and after the interval of a few weeks is again cut down upon and an end-to-end suture accomplished. This method is full of promise.

In 1907 Murphy described a method of wrapping the suture ends with fascia which he warmly advocated as preventing the invasion of connective tissue from the sides. This method was much practised early in the war but has been largely abandoned. The employment of calves' arteries, vein, cargile membrane, or fat for this purpose has also fallen into disuse. These all tend to throttle the nerve. The best bed is an intermuscular plane, or, where there is extensive cicatrization the nerve may be transplanted to a bed between the deep and superficial fascia (Frazier).

It was to repair large defects that the various operations were devised which occupied pages of the pre-war text-books; various methods of nerve transplantation, autogenous, homogenous, and heterogenous; neuroplasty, the so-called flap methods; suture à distance; tubulizations; resection of the bone; nerve anastomoses.

Nerve transplantation has been on a sound experimental basis for years, and high hopes have been held out at times for its usefulness. A large number of autogenous grafts have been done during the war, using one or more strands from a sensory nerve to bridge the defect. Moynihan's conclusions are that nerve grafting is of little value. Tinel is noncommittal. André Thomas concludes that grafting should only be resorted to when no other measure is possible. He quotes Gosset's results, where out of a large number of cases there were but two partial recoveries. Frazier concurs in stating an autograft is warranted only as a last resort. Rawling writes, "Grafting, implantation, etc., are comparatively useless." On the other hand Deleganiere reports three cases as complete successes. Jocelyn Swan had motor recovery following nerve grafts and advises against a condemnation of the method, with which Joyce in a carefully prepared article agrees. We must await the report of the commissions on this vexed question, meanwhile bearing in mind the emphatic words of Sir Robert Jones, who in quoting the unpublished report of the British Commission, states that in a large number of cases there has not been found one case of complete recovery, and but very few partial recoveries. Most cases, he writes, are complete failures.

Little has been written on homografts, because few of these have been done, but one looks in vain for any words of praise.

Burghard, in his system (1914), describes at length the various methods of "nerve-bridging", and concludes that as a rule the choice will be made between the heteroplastic form of the plastic methods, or one of the transplantation methods, either catgut or a nerve from one of the lower animals being made use of. Binnie, in 1916, writes: "The favourite method of bridging gaps is by means of several strands of chromicized catgut (distance sutures)." Tinel's reference to this procedure is that pseudo graftings by interposition between the nerve segments of fragments of aponeurotic sheaths of catgut threads to serve as conducting wires are wholly illogical and inevitably condemned to failure; there is nothing but nerve tissue that can serve as a conductor for regenerating axis-cylinders. Frazier writing on suture à distance, says he knows of no success in human surgery. In 1916, Dean Lewis and Kirk reported some very interesting experimental work on dogs in which they established regeneration across considerable gaps between ends of divided nerve trunks, which were surrounded by autogenous fascial tubes used essentially as a conducting tunnel, expressing the hope that the method would prove applicable in the human, but conceding the difficulty of drawing conclusions regarding the re-establishment of function in animals, as in dogs nerve repair takes place readily, even when no attempts at repair are made. Recently Platt of Manchester has presented a valuable paper reporting fifteen cases of autogenous graft with fascial tubulization, and ten cases of fascial tubulization alone—all in the human. The result in every case was identical—a complete absence of any clinical sign of recovery.

The other methods formerly advocated, flap methods, and various forms of nerve anastomosis have few advocates to-day. One possible exception is in the type of case reported by Joyce, where a double lateral implantation of the ulnar into the median was done, with some motor and sensory recovery in the ulnar after twenty-four months; but at best recovery is slow and uncertain.

After care has received much emphasis; massage, galvanism, and careful splinting to maintain the paralyzed muscles in a position of relaxation. Perhaps the greatest of these is the maintenance of relaxation. Re-education must be undertaken as early as possible. For recovering cases purposeful movements, as in curative workshops, are of prime importance in the restoration of function. André Thomas' remarks are worthy of emphasis. "All orthopædic apparatus useful during the period of complete paralysis becomes frequently harmful during the period of restora-

tion. As soon as the mobility of the organ returns it is advisable to use orthopedic apparatus as little as possible."

The prognosis varies to some extent with the individual nerves. The musculo-spiral has the best reputation. Regeneration in the ulnar is usually poor as regards the intrinsic muscles of the hand. It has been suggested that this is due to a distortion of the nerve pattern (Gwynne Williams), to the difficulty of keeping the small muscles relaxed or to some inherent property of the muscles themselves due to their highly complex movements (Joyce).

The results of nerve operation have been much questioned. On this point Tinel writes: "To us there does not appear to be any doubt at all on the matter. Nerve suture practised under favourable conditions almost invariably succeeds" He estimates at from 12 to 15 the percentage of failure in all cases. One must especially guard against impatience in foretelling failure, for nerve growth at best proceeds with extreme deliberation. I believe this optimism to be shared by those who have had the widest experience.

DIURESIS AND THE CAFFEIN GROUP OF DIURETICS

BY D. SCLATER LEWIS, M.D.

Montreal

RICHARDS, A. N. and PLANT, O. H.: "URINE FORMATION BY THE PERFUSED KIDNEY. PRELIMINARY EXPERIMENTS ON ACTION OF CAFFEIN." *Jour. Pharmacol. and Exper. Therap.*, 1915: vii, 485.

TAYLOR, L.: "CLINICAL STUDIES OF CAFFEIN." *Arch. Int. Med.*, 1914: xiv, 769.

CHRISTIAN, H. A., FROTHINGHAM, C. *et al.* "STUDIES OF NEPHRITIS." *Amer. Jour. Med. Sci.*, 1915: cl, 655.

CHRISTIAN, H. A.: "SOME STUDIES OF A DIURETIC" (THEOCIN). *Arch. Int. Med.*, 1916: xviii, 606.

THE normal process of urine formation in the higher animals is a combination of filtration and active secretion. The water and salt are passed through the kidney chiefly by a process of filtration or osmosis, while the urea and nitrogenous waste products are actively secreted by the cells which line the renal tubules. During a period of diuresis the main increase is in the salt and water constituents of the urine, and some authorities have claimed that an increased rate of filtration is the only essential actor in the production of a diuresis, no matter whether it arises from an increased water intake or from the action of specific drugs.

They claim that caffeine produces its effects wholly by an increased rate of blood flow through the kidney, and deny any specific action of the drug on the renal cells. On the other hand Phillips, Rose Bradford and others claim for caffeine and its allies, a definite stimulating action on the kidney cells, quite apart from any effect that these drugs may have on the rate of blood flow.

Perfusion of the isolated kidney seemed to offer a means of settling this vexed question, but the results of these experiments were of little value because of the highly pathological character of the urine secreted by the perfused organ. Recently, however, Richards, Drinker and Platt have succeeded in perfusing kidneys with aerated blood in such a way that the resulting urine has been almost normal in appearance and constitution. Thus they have been able to study the effects of caffeine under controlled conditions of blood flow, and with absolute exclusion of nervous impulses. They find that the drug produces its diuretic effect even when the rate of flow through the kidney is maintained at a constant level. This points to a direct stimulation of the renal epithelium analogous to the drug's stimulation of the muscle and central nervous system cells. This view is also supported by Barcroft and Straub's findings that in certain forms of diuresis there is a marked increase in the gas metabolism of the kidney, which indicates a definite increase in the cellular activity of the organ, and suggests that the diuresis is not entirely the result of an accelerated blood flow through the kidney with its attendant increase in the rate of filtration.

From the clinical standpoint, caffeine and its allied drugs, theobromin and theocin, have also received a considerable degree of attention in the past decade. These investigations have proved once again, the fallacy of applying the laboratory results directly to the patient. According to Sollmann and Pilcher, caffeine causes a vasodilatation with a sufficient stimulation of the heart to maintain or even increase the blood pressure. Obviously this causes an augmented rate of flow. Means and Newburgh confirm these results in experiments on normal men, in whom they measured the rate of flow by an indirect method. However, in its clinical application to cardiac disease, Taylor can find no permanent effect on the pulse rate, while the final effect on the blood pressure is a definite drop of from 10 to 15 mm. of mercury, and this drop may persist for some time after the drug has been withdrawn. He finds the diuretic effect of the drug is slow to appear and only reaches its maximum about the third or fourth day of administration. The degree of diuresis varies inversely with the pressure, i.e. the greater

the drop in pressure the greater the diuretic response. Large doses of the drug (cafein citrate 60 grains) a day are necessary to produce any diuretic effect and these large doses are very liable to produce unpleasant symptoms, of which the most marked are nervousness, insomnia, nausea and vomiting. In comparison he states that theobromine sodium salicylate in doses of 80 grains a day causes a diuretic response within twenty-four hours, and it is consequently unnecessary to wait three or four days, as is the case with cafein, to see whether the kidney is going to respond to the drug or not. Further there are no unpleasant symptoms, no nervous or gastric disturbances. He concludes that the clinical efficiency of cafein has been very much overrated, and that theobromine is a much better diuretic in every way.

Diuretics produce their main response in cases where there is considerable œdema, in other words where there is an available supply of water to be excreted. Another factor of importance, is the presence of a renal epithelium capable of responding to the stimulus afforded by the drug. The series of studies made by Christian, Fitz and others is of particular interest in this respect, and three points receive constant emphasis. First, that the diuretic drugs produce but little effect if there is no œdema. Second, that the damaged renal epithelium of nephritis, rarely responds to a diuretic in a satisfactory manner. Third that the diuretics are marked irritants to the kidney, and frequently depress the kidney function rather than stimulate it.

In accord with these findings they report that cases of acute nephritis rarely react to a diuretic, and that even if they do, this reaction is usually followed by such a depression of function that any good effects are soon obliterated. A depression of this character following a single dose of theobromin or theocin, is more a sign of fatigue than of actual damage, but if the drug is used repeatedly, then signs of damage appear and the drug may even hasten a fatal issue. They state that in cases of chronic nephritis, with or without œdema, and without cardiac decompensation, diuretic drugs more often *fail* to produce a diuresis than the reverse. In cases of cardiorenal diseases, however, these drugs often produce a striking response.

What then are the indications for the use of the diuretics? What effects should we expect from their administration? In the nephritides with a marked retention of the nitrogenous waste products and an impending uremia, the toxic symptoms are due largely to the increased concentration of these waste products in the blood. In a diuresis the main increase is in the watery portion

of the urine, the output of salt is increased to a certain extent but the diuretics have little if any effect on the output of urea. If then a diuresis were obtained in a case of nitrogen retention, the withdrawal of water and salt would simply result in an increased concentration of the nitrogen and "uremic" bodies, an effect which is the reverse of the one desired. In these cases our efforts should be directed to diluting these toxic substances rather than to increasing their concentration, and a moderate grade of oedema would seem to be almost a beneficial factor. Such a course of treatment is actually followed in diabetes, a disease in which at times of impending coma there is a piling up of toxic substances. Here Joslin recommends the administration of salt to produce if possible a mild grade of oedema with a consequent dilution of the toxic products. In other words the treatment is directed towards combatting the diuresis produced by the hyperglycemia rather than attempting to increase it.

In chronic nephritis with a salt retention the oedema is rarely of importance, the increased amount of salt is doing little if any harm, and there is no urgent reason for attempting to remove it, at the risk of damaging the kidney by the use of drugs that are absolutely irritating to the organ. We should employ other methods for removing the salt without placing extra strain on a damaged structure. (Salt poor diet; Karrel cure: Sweat baths etc.).

In those cases, however, where there is a massive oedema associated with a myocardial insufficiency, theobromin or theocin accompanied by digitalis often causes a marked diuresis. Here the oedema is doing harm, and we benefit the patient by removing it. There is no toxic nitrogen retention and the removal of nitrogen is not expected or desired. Even in these cases a free diuresis is often followed by a drop in the kidney function as measured by the phthalein excretion, as if there were an outspoken fatigue of the renal cells. This finding gives point to the clinical observation that diuretic drugs give their best results when exhibited in courses, with periods of intermission during which the kidney is able to recover its functional capacity.

From the above it would seem that the diuretics have a comparatively restricted field of usefulness. They are indicated chiefly where there is oedema of cardiac origin but they are absolutely contraindicated in cases of acute nephritis and in the nephritides characterized by a retention of the nitrogenous end-products of metabolism.

Obituary

DR. JAMES E. SPRAGUE

DR. JAMES E. SPRAGUE died of pneumonia, April 23rd, at Belleville at the age of seventy-five. He was a prominent practitioner and well-known writer on medical subjects. Dr. Sprague graduated in medicine at Victoria University, Cobourg. He practised his profession in Stirling, Ontario, for thirty-four years, afterwards removing to Perth and finally to Belleville. From 1890 to 1894 he was examiner at Trinity Medical College on medical jurisprudence, and from 1903 to 1907 an examiner in medicine for the Ontario College of Physicians.

HERBERT WILLIAM WILSON, M.D., formerly of Tamworth, Ontario, died at his late residence, Toronto, on April 24th.

DR. JOSEPH P. LAVOIE, of Quebec, died on April 15th, at the age of sixty-five years.

DR. ROBERT LOUNT died at Hemstead, Long Island, April 5th, in his seventy-sixth year.

DR. J. LESLIE FOLEY died at Montreal on April 9th. He was born in Montreal sixty years ago, graduated at Bishop's College and also held the degrees of M.R.C.S. and L.R.C.P.

DR. THOMAS WILSON LAMBERT, medical officer in charge of the Western section of the Canadian Pacific Railway, and widely known throughout British Columbia, died on April 10th, in London, England.

THE death occurred at sea of Dr. James Pointon, the oldest surgeon in the Cunard fleet. He was sixty-six years of age.

DR. NELSON P. FREEMAN died at Bridgewater, Nova Scotia, April 16th. He was fifty-five years of age.

SAMUEL G. BARTON, M.D., died at his home, Toronto, April 21st, at the age of fifty-eight.

Miscellany

REPORT OF MEETING OF THE AMERICAN AND CANADIAN SECTION OF THE INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS

THE thirteenth annual meeting and exhibition of this Society was held at Cornell University Medical College on April 1st and 2nd last, in conjunction with the meeting of the American Association of Pathologists and Bacteriologists. Dr. O. Klotz, of Pittsburgh, retiring President, was in the chair, and Dr. Roy Miner, of New York, attended as delegate from the American Association of Museums. The programme was opened by addresses delivered by Drs. Klotz and Maude E. Abbott on "The Pathological Collections and the Activities on behalf of the Medical Museum and of this Association of the late Sir William Osler", with whose assistance the Association was organized and the small endowment fund which it possesses obtained. A report on "The Central Bureau for North America for the Preservation of Microscopic Results of Medical Research" which was established by the Association some years ago, but has not yet been operated for lack of funds, was presented by Leo Loeb, of St. Louis, Mo., urging the importance of this Bureau and the necessity for its immediate operation. The Canadian National War Museum gave two important contributions, "Museum Records Illustrating Facial War Injuries," demonstrated by Major E. F. Ridsen, of Toronto, and "Lantern Slides from Water-color Paintings, showing the Canadian Army Medical Arrangements at the Front", shown by Major G. A. Campbell, of Ottawa. Among other items of special interest were a demonstration-exhibit of Bone Tumours which included some unusual forms of Cell-neoplasm, by Professor James Ewing, of Cornell Medical College, stereoscopic pictures showing dissection of the actual and accessory muscles of the eye by Professor S. E. Whitnall, Montreal, the communication of a new preservative fluid for delicate specimens, and a fine demonstration of the microscopic appearances of the various species of liver-flukes by Dr. F. S. Jackson, of Montreal.

The following officers were elected for the ensuing year: Presi-

dent, W. M. L. Coplin, Philadelphia; Secretary-Treasurer, Maude E. Abbott, Montreal; Assistant Secretaries, L. Gross, Montreal; and H. Goldblatt, Cleveland.

RESOLUTION ON THE DEATH OF SIR JAMES GRANT

At the regular meeting of the Medical Board of St. Luke's General Hospital, Ottawa, held March 15th, 1920, the following resolution was submitted and passed:

RESOLVED:—That the Medical Board of St. Luke's General Hospital, Ottawa, at its earliest opportunity desires to place upon record its profound sympathy with Lady Grant and the members of her family in the great loss they have all sustained recently in the death of Sir James Grant, K.C.M.G., F.R.C.S., etc.

No name was wider known, or more respected, than that of the distinguished physician who passed through a long life of usefulness to society in general and to his fellowmen in particular. His love for his profession was his outstanding characteristic and wherever he went throughout the length and breadth of Canada, and in other lands, to advance the best interests of medicine and surgery he invariably received a unique welcome. To the profession of Ottawa, to whom he was best known, he endeared himself by his strong personality and integrity and it is universally admitted amongst us here that a blank has been left which will never be filled. He was philosopher and friend to all.

Sir James' Association with St. Luke's Hospital at Ottawa, where he has been on the consulting staff since its formation in 1898, will ever remain a pleasant memory to all his confrères, and it was a peculiar gratification to the entire staff to know that his last hours, due to an unfortunate accident, were spent in St. Luke's where he was ministered to by his eldest son and by his nephew, also members of our medical staff.

UNIVERSITY OF TORONTO EXTENSION COURSE IN PÆDIATRICS

LECTURES

1. Eight lectures on infant feeding, including physiology and pathology of digestion, with a discussion of the percentage and caloric methods in infant feeding.

2. Four lectures on the acute-intestinal disorders, illustrated by cases.

3. Four lectures on congenital and acquired heart disease and allied topics, also illustrated by cases.

4. Four lectures on infectious diseases.

5. (a) Neurology, illustrating the more common nervous disorders of children, with special reference to the examination of such patients.

(b) Syphilis, illustrating the methods of diagnosis and treatment.

(c) The diagnosis and management of malnutrition in older children.

In addition to the lectures, bedside clinics will be given daily and there will be ward work under supervision, as well as demonstrations of pathological specimens and x-ray plates.

The course will be given at the Hospital for Sick Children throughout the month of July. Any part, however, of the course may be taken by arrangement. The fee for the whole course or any part of it will be \$20.00.

News

ONTARIO

OTTAWA has been made the headquarters for Canada's vital statistics. Returns from all over the Dominion are, in future, to be tabulated there. Formerly these were all completed and published separately in each province, or in those provinces where the work was done at all. It is expected all the provinces will take advantage of the new method.

A BOARD of Tuberculosis consultants has been appointed by the Director of Medical Services of the Department of Soldier Civil Re-establishment to visit each of the twenty-three sanitoriums in Canada. The personnel of the board follows: Dr. C. D. Parfit, Ontario; Dr. J. R. Byers, Quebec; Dr. W. M. Hart, Saskatchewan; Dr. A. F. Miller, Nova Scotia; Dr. N. A. Stewart, Manitoba.

In eleven schools of Toronto, Dr. Clarke, medical director of the Canadian National Committee of Mental Hygiene, has found

three hundred and twenty-five pupils with an intelligence quotient of less than 80 per cent., and out of one hundred and twenty-two defectives below 70 per cent, one hundred are possessed of the characteristic stigmata of degeneration. Dr. Clarke investigated these schools at the request of the Toronto Board of Education, and has recommended the segregation of low grade defective children in two or more special classes, centrally located.

QUEBEC

THE Provincial Government has designated the committee, authorized by a law of the last session for public protection against venereal diseases. They are: Dr. A. Simard, Quebec; Dr. S. Boucher and Dr. J. A. Hutchinson, Montreal. Dr. A. H. Desloges has been named director of anti-venereal service and Dr. Ranger assistant director. Dr. A. St. Pierre, Montreal, will be the director of provincial hospitals. The committee can establish free dispensaries and laboratories for the treatment of venereal diseases, provide for the treatment of venereal patients detained in jails, asylums, etc., and promote educational propaganda.

MANITOBA

THE new medical act, as amended on suggestions by the Medical Association of Winnipeg, was passed in part recently by the legislative law amendment committee. The amendment furnishes the council or committee in charge with wider powers.

ALBERTA

STATISTICS show that the recent epidemic in Alberta (1920) was much lighter in type than the previous one of 1919. For the same period in the first epidemic, covering about one month, there were two thousand deaths in the province against the late record of two hundred and sixty-six.

SASKATCHEWAN

EIGHT clinics have been opened in Saskatchewan for the treatment, without charge, of venereal disease. They are located at Regina, Saskatoon, Moose Jaw, Prince Albert, Swift Current, North Battleford, Weyburn and Yorkton. A director in charge has been appointed to devote his full time to the work in connection with the Bureau of Public Health. Eight dispensaries are now completely equipped and in operation.

BRITISH COLUMBIA

At the recent conference of the various bodies called together by the British Columbia Red Cross Society in Vancouver, two resolutions were adopted. The first stated that the provincial branch is prepared to furnish and maintain ten stations and public health nurses for the Red Cross first aid districts. Such stations and nurses are to be distinctly Red Cross and arrangements for the training and the maintaining the supply of these nurses will be made with the Victorian Order of Nurses. The second resolution empowered a committee to investigate the wisdom and possibility of establishing and maintaining a Red Cross Chair of Public Health in the University of British Columbia "in connection with the Department of Nursing now established therein, and to co-operate with the provincial authorities in the education of nurses devoting themselves to social service."

Books Received

NERVOUS AND MENTAL DISEASES. By ARCHIBALD CHURCH, M.D., professor of nervous and mental diseases, Northwestern Medical School, Chicago; and FREDERICK PETERSON, M.D., formerly professor of psychiatry, Columbia University. Ninth edition. 949 pages with 250 illustrations. Price \$5.50. Publishers: W. B. Saunders Company, Philadelphia and London, 1919.

HENRY QUIN, M.D., president and fellow of the King and Queen's College of Physicians of Ireland, and King's professor of practice of physic (1718-1791). By T. PERCY KIRKPATRICK, M.D., M.R.I.A., fellow and registrar of the Royal College of Ireland. Printed at the University Press, by Ponsonby & Gibbs, Dublin, 1919. Price, 10/6 net.

ARTERIOSCLEROSIS AND HYPERTENSION. By LOUIS M. WARFIELD, A.B., M.D., F.A.C.P., formerly professor of clinical medicine, Marquette University Medical School. Third edition. 265 pages with illustrations. Price \$4.00. Publishers: C. V. Mosby Company, St. Louis, 1920.

- THE LINK BETWEEN THE PRACTITIONER AND THE LABORATORY.** A Guide to the Practitioner in his relations with the Pathological Laboratory. By CAVENDISH FLETCHER, M.B., B.S. LOND., M.R.C.S., L.R.C.P., director, laboratories of public health, London; and HUGH McLEAN, B.A., B.C., D.P.H., M.R.C.S., L.R.C.P., assistant pathologist, laboratories of pathology and public health, London. First edition, 91 pages, with 7 illustrations. Price 4/6 net. Publishers: H. K. Lewis & Co., Ltd., London, 1920.
- MODERN ANÆSTHETICS.** By J. F. W. SILK, M.D., senior anæsthetist and lecturer on anæsthetics, King's College Hospital. Second edition. 191 pages with 37 illustrations. Price, 7/6 net. Publishers: Edward Arnold, 41 Maddox Street, London W., 1920.
- HANDBOOK OF DISEASES OF THE RECTUM.** By LOUIS J. HIRSCHMAN, M.D., F.A.C.S., vice-chairman, section on gastroenterology and proctology, A.M.A., Third edition. 378 pages with 223 illustrations and 4 coloured plates. Price, \$5.00. Publishers: C. V. Mosby Company, St. Louis, 1920.
- THE DIAGNOSIS OF NERVOUS DISEASES.** By SIR JAMES PURVES STEWART, K.C.M.G., C.B., M.D., F.R.C.P., senior physician to the Westminster Hospital, etc. Fifth edition. 584 pages with illustrations. Price 30/- net. Publishers: Edward Arnold, 41 Maddox Street, London W., 1920.
- INDIGESTION.** DR. G. HERSCHELL'S TEXTBOOK OF INDIGESTION, revised and rewritten by ADOLPHE ABRAHAMS, O.B.E., M.D., assistant physician to Westminster Hospital, etc. Fourth edition. 228 pages with 8 plates. Price 10/6 net. Publishers: Edward Arnold, 41 Maddox Street, London W., 1920.
- PERSONAL BEAUTY AND RACIAL BETTERMENT.** By KNIGHT DUNLAP, professor of experimental psychology in the Johns Hopkins University. Price, \$1.00. Publishers: C. V. Mosby Company, Metropolitan Building, St. Louis, Mo., 1920.
- STANDARD NOMENCLATURE OF DISEASES AND PATHOLOGICAL CONDITIONS, INJURIES AND POISONINGS FOR THE UNITED STATES.** First edition. Government Printing Office, Washington, 1920.

REPORT FROM THE DEPARTMENT OF PATHOLOGY AND THE DEPARTMENT OF CLINICAL PSYCHIATRY, CENTRAL INDIANA HOSPITAL FOR THE INSANE, 1915-1916 and 1916-1917. Vol. VII. Wm. B. Burford, Contractor for State Printing and Binding, 1919.

OCCUPATIONAL AFFECTIONS OF THE SKIN, Their Prevention and Treatment with an Account of the Trade Processes and Agents which give Rise to Them. By R. PROSSER WHITE, M.D., M.R.C.S., life vice-president, dermatologist, senior physician and enthetic officer, Royal Albert Edward Infirmary, Wigan. Second edition. 360 pages with illustrations. Price 25/- net. Publishers: K. H. Lewis & Co., 136 Gower Street, London, W.C. 1., 1920.

Book Reviews

THE DIAGNOSIS OF NERVOUS DISEASES. By SIR JAMES PURVES STEWART, K.C.M.G., C.B., M.D. (EDIN.), F.R.C.P. Fifth edition.

The fifth edition of this work will be welcome to the profession generally. The student, the general practitioner, and the neurologist will find it a volume of exceptional value. The plan is similar to previous editions, but much of it has been rewritten, the whole revised and valuable additions made, bringing it up to the very latest date. This work which has already been translated into three languages, is so well known it scarcely needs detailed descriptive comment. Suffice it to say that after a succinct but comprehensive chapter on anatomy and physiology, nervous diseases are discussed from a practical anatomical and symptomatic standpoint. Probably no other work in neurology gives such a wealth of explanatory detail in such concise form. A chapter on war neurosis and a frank well-timed criticism of the Freudian theory are added attractions to this edition. Since the profession will repeatedly be face to face with varieties of nervous diseases resulting from the war, the whole book will be decidedly useful to the profession at large and no one can do better than thoroughly familiarize himself with its contents.

F. B.

PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS. BY JOHN C. DAcOSTA, JR., M.D., ex-associate professor of medicine, Jefferson Medical College. Fourth edition, thoroughly revised. 602 pages with 225 original illustrations. Price, cloth, \$4.75 net. Publishers: W. B. Saunders Company, Philadelphia, 1919.

THE fact that this book has reached its fourth edition is good evidence of its worth. The illustrations are excellent. The book is well adapted to the needs of the medical student and the medical practitioner.

The chapters on diseases of the broncho-pulmonary system are particularly good. The discussion of differential diagnosis, which is so essential, is thorough but not tedious, as well as that on other diseases which pulmonary diseases may simulate, viz.: pneumonia simulating meningitis, peritonitis, etc.

A few pages are devoted to "Soldier's Heart". The fact that its pathology is obscure and that theories concerning it are numerous, perhaps, accounts for the small amount of space allotted to this interesting and very important subject. The condition is, however, accurately described. The United States army exercise test which brings out the symptoms to which Lewis has applied the term "effort syndrome" is described and can be readily used by all.

The radiographs and photographs of abdominal conditions, normal and abnormal, are very instructive and should prove to be of great value to the reader.

C. A. P.

THE HEALTH OF THE TEACHER. BY W. E. CHANCELLOR, M.D. Publishers: Forbes and Company Chicago, 1919. Price, \$1.25 net.

IN a neatly bound well-printed book of 300 pages, Dr. Chancellor takes up the subject of the health of the teacher in the United States of America.

He divides his subject into two parts. Part I.—The Principles of Diagnosis and Cases. Part II.—The Rationale of Health Control.

In the first part he discusses the various races from which the great majority of the teachers are drawn, and the temperaments of these various races; from this he deduces from what illness each type is likely most to suffer.

In the second part he takes up the conditions of every day life, such as sleep, food, clothing, exercise, etc., and gives advice as to the best way of maintaining one's health.

In the last chapter he gives a short summary of the whole subject. There is a good deal of valuable information in the book; but it is very hard to read, and at times hard to follow his deductions.

J. G. W.

DISEASES OF WOMEN. By TEN TEACHERS. Under the direction of COMYNS BERKELEY, M.A., M.D., M.C., F.R.C.P., obstetric and gynaecological surgeon to the Middlesex Hospital. Edited by COMYNS BERKELEY and others. 650 pages, illustrated. Price, 30/- net. Publishers: Edward Arnold, 41 Maddox Street, London W., 1919.

The author of an individual chapter is not known, but the text has been submitted to an editorial board composed of the ten teachers and to a certain extent reflects the views of all. The anatomy and physiology of the generative tract is first dealt with, followed by a section dealing with the various symptoms associated with diseases of genital organs. The various pathological conditions are then taken up and the text is written in a clear, concise manner and is well illustrated. An interesting chapter deals with "Chronic ill-health in women from the psychological aspect; neurasthenia in relation to pelvic disorders; and the author discusses "ovaritis" and "congestion of ovary", etc., in a very sane and painstaking manner.

The book concludes with a short resumé of gynaecological operations and the preparations for, and after treatment of the various procedures undertaken.

SWANZY'S HANDBOOK OF THE DISEASES OF THE EYE AND THEIR TREATMENT. Twelfth edition. Edited by LOUIS WERNER, M.B., F.R.C.S.I., surgeon to the Royal Victoria Eye and Ear Hospital, Dublin. 671 pages with illustrations. Price, 22/6 net. Publishers: H. K. Lewis & Co., Ltd., 136 Gower Street, London, W.C. 1, 1919.

As a manual, there is no text-book in ophthalmological literature better than that of Swanzy.

The present edition has been subjected by the editor to a complete and careful revision. The diseases of the cornea have

been reclassified, and some additions made, including a brief account of superficial linear keratitis. Amongst other additions and improvements may be mentioned the description of acne rosacea keratitis, hypotony, a summary of the methods of diagnosis in chronic uveitis, and a résumé of the investigations of Dr. Gordon Holmes on the cortical centre of vision.

The operations of excision of the lacrimal sac, and of the transplantation of mucous membrane for trichiasis have been described in greater detail, and a few others have been introduced.

The plan of the text-book is excellent. Subjects of paramount importance receive full treatment in large print; while those of less, or little, moment are relegated to smaller space in finer type. Proper values are thus maintained. Our suggestion is, that this principle might with advantage be followed out even more fully. The sections on eye changes in nervous disorders and systemic disease have always been a praiseworthy feature of this highly commendable work.

W. G. M. B.

ATLAS OF OPERATIVE GYNÆCOLOGY. By BARTON COOKE HIRST, M.D., professor of obstetrics, University of Pennsylvania. 292 pages, 164 plates, 46 figures. Price, \$7.00 Publishers: J. B. Lippincott Company, Philadelphia, London, and 201 Unity Building, Montreal, 1919.

The Atlas is beautifully illustrated by plates showing steps of various operations and everywhere the text is subordinate to the illustrations. The author deals first with equipment and preparation for gynæcological operations, and engravings of instruments used are shown. He condemns spinal anæsthesia in gynæcological operations. He does not believe in the immediate repair of genital tract following confinement, but waits until the fifth day post partum and then under anæsthesia repairs the lacerated tissues. For cystocele he favours the Watkins operation in selected cases. In retroversion of uterus he favours the old Alexander operation done through a Pfannenstiel incision and at the same time performs a coeliotomy, deals with pathological conditions found and does a temporary suspension by using single suture of catgut. He describes in detail the operation of extra and intra peritoneal Cæsarean section, and pubiotomy. In the last chapter he discusses and beautifully illustrates the various operations for pathological conditions of the mammary gland.

